PROPOSED FASTFRATE WAREHOUSE FACILITY
RIDEAU ROAD, OTTAWA

TRANSPORTATION IMPACT STUDY

Presented to:

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CASTLEGLENN CONSULTANTS LTD.

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TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

1.0 EXISTING AND PLANNED CONDITIONS

1.1 PROPOSED DEVELOPMENT

Exhibit 1-1 illustrates the location of the proposed Fastfrate warehouse development located nearest the corner of the Rideau Road / Somme Street intersection in Ottawa, Ontario. The site is located within Block 5 of the 72-hectare Tomlinson Hawthorne Industrial Subdivision.

Exhibit 1-2 illustrates the proposed site plan (Jan. 2020) including the proposed access arrangement to Somme Street. The proposed development is anticipated to provide for:

- Approximately 90,685 sq. ft. (8,425 m^2) of warehouse space which is composed of a standard warehouse, a cross-dock facility and an e-commerce area; and
- Approximately 260m^2 of supportive office space attached to the warehouse building.

The proposed developed is located in the Rural Area (Schedule A, Official Plan). A review of the existing zoning by-law indicates a "RH – Rural Heavy Industrial Zone" designation of which a warehouse is a permitted land use. The site is currently greenfield. This Traffic Impact Study is in support of an application for Site Plan Control Approval.

Exhibit 1-1: Site Location Context

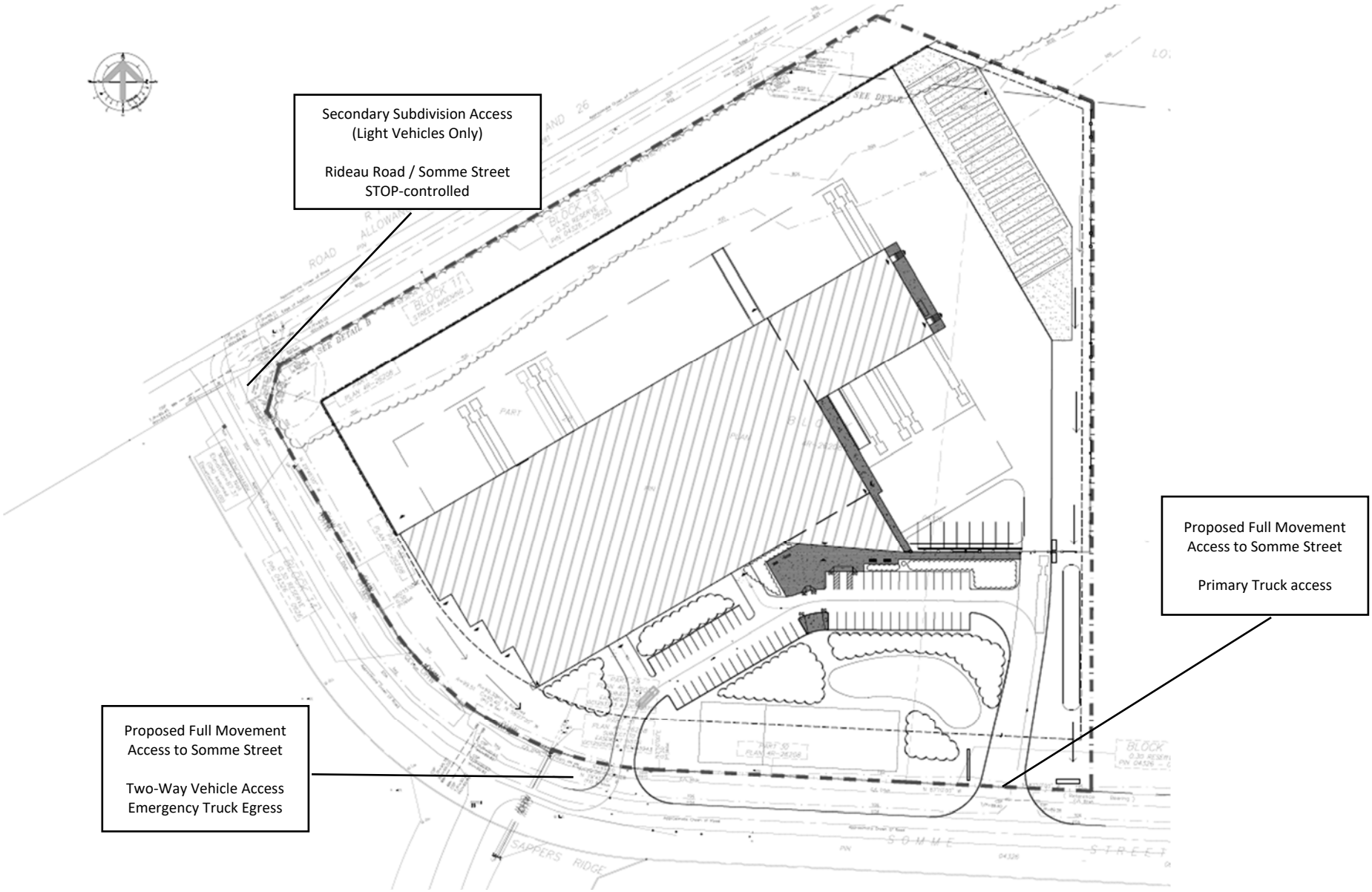


Exhibit 1-2: Site Plan (May, 2021)

Exhibit 1-2 illustrates the preliminary draft site plan for the proposed Fastfrate warehouse development. The proposed development would be accessed by way of two locations:

- A full movement access near the east site boundary intended for the access and egress of trucks destined to the facility. The driveway provides for more than 50m of throat length and 70m of storage for trucks to queue storage at the gate entrance. Inbound and outbound truck maneuvers would be undertaken to and from east of the site; and
- A full movement access 120m west of the truck access intended primarily for employee vehicles. The access would also be used on an emergency basis for heavy trucks not admitted to the gate, which is anticipated to occur on very rare occasions.

The Hawthorne Road/Somme Street intersection is envisioned to provide the primary access/egress for the Tomlinson Industrial Park subdivision. The intersection would be required to provide for heavy vehicle maneuvers to and from the north. Appendix "E" provides preliminary swept path exhibits for the Hawthorne Road/Somme Street intersection.

A review of the swept paths indicated unacceptable turning maneuvers for the WB-21 design vehicle due to the degree of overlap between the inbound vehicle and a vehicle stopped along Somme Street. It is anticipated that additional corner radii would be required to accommodate safe access and egress for trucks to and from Somme Street.

1.2 EXISTING CONDITIONS

Study Area Roadways

The City of Ottawa TMP (Map 6) was referenced along with a desktop review of aerial photography to document the existing roadways that would serve the proposed development and surrounding area:

- **Rideau Road** is an existing 2-lane east-west undivided two-lane arterial roadway (posted speed 80 km/hr) located north of the proposed development. Fronting the site, Rideau Road is a restricted load corridor east of Hawthorne Road. Rideau Road provides access to light industrial, mineral extraction sites and material storage facilities to the west. No pedestrian or cycling infrastructure is provided within the study area;
- **Hawthorne Road** is an existing 2-lane undivided arterial roadway posted at 80 km/hr. The roadway begins south of Rideau Road and serves as a full load truck route connecting to Hunt Club Road and Leitrim Road to the north;
- **Somme Street, Sappers Ridge** are existing rural local roads that serve the Tomlinson Hawthorne Industrial Park. Both local roads provide for 2-lanes, a 7m pavement width, lack a marked centerline and are assumed to be posted at 40 km/hr. No pedestrian or cycling facilities are provided internal to the subdivision.

Area Traffic Management

No Area Traffic Management strategies have been identified for the boundary roads within the study area.

Study Area Intersections

Hawthorne Road/Rideau Road: This intersection is a 4-leg STOP-controlled intersection with single-lane approaches. The eastbound approach is characterized by a steep grade and significant horizontal curvature in advance of the intersection.

Rideau Road / Somme Street: This intersection is a 3-leg intersection with STOP-control on the northbound approach. The intersection offers corner radii that are less than 10m. The northbound approach is currently closed to traffic.

Somme Street / Sappers Ridge: This 3-leg uncontrolled intersection is located internal to the subdivision. It is likely that the intersection is to operate with STOP-control on Sappers Ridge and free-flow along Somme Street. The position of the intersection offers unobstructed views in either direction along Somme Street from Sappers Ridge.

Hawthorne Road / Somme Street: This 3-leg intersection provides for STOP-control on the minor leg. This intersection is anticipated to serve as the primary access/egress intersection to the subdivision, particularly for heavy vehicle maneuvers.

Existing Multi-Modal Facilities

A review of the City of Ottawa's "*Map 1: Cycling Network – Primary Urban"* from the Transportation Master Plan indicated no significant cycling facilities within the study area. The study area provides for 2-lane roadways with gravel shoulders with no sidewalk provisions.

A review of the February 2019 traffic count at Rideau Road / Hawthorne Road indicated no cyclists nor pedestrian activity. This would be expected given the rural nature of the area, the lack of active modes infrastructure and the time of year of the traffic count.

Existing Transit Provisions

No transit routes area available along Rideau Road and Hawthorne Road within the study area.

Existing (2020) Traffic Volumes

Exhibit 1-3 illustrates the existing morning and afternoon peak hour traffic volume at the intersection of Rideau Road/Hawthorne Road (February, 2019) and the adjacent Tomlinson Hawthorne Industrial Subdivision accesses. The turning movements at the Hawthorne Road / Somme Street intersection have been estimated. The traffic counts were augmented by 1% on all turning movements to represent a low growth potential between 2019-and-2021 existing conditions.

Appendix "D" provides existing turning movements counts provided by the City of Ottawa.

A review of the traffic volumes indicated:

- During the morning peak hour, the southbound Hawthorne Road traffic represents the peak direction of travel with more than 400 vehicles destined to areas along Rideau Road and west of the study area;
- During the afternoon peak hour, the peak direction reversed to involve vehicles originating from Rideau Road and destined to Hawthorne Road northbound; and

- The SB-RT (AM: 10% / PM: 36%) and EB-LT (AM: 26% / PM: 9%) heavy vehicle volumes were found to be significant.

Existing Road Safety Information

Five (5) year (January 1st, 2015 to December 31st, 2019) historical collision information was reviewed for the Hawthorne Road/Rideau Road intersection (Appendix "D"). The collision information provides:

- the date and time of each collision;
- the type of collision (i.e. angle collision, rear-end);
- the level of damage involved;
- vehicle details (truck, passenger vehicle, etc.);
- vehicle path/maneuver characteristics; and
- the number of pedestrians involved (in the collision).

A standard collision rate based on the number of collisions- per-million-entering-vehicles (MEV) was calculated where rate greater than 1.0 collisions/MEV was considered to pose a potential safety concern.

The following provides a summary of the collision information collected and evaluated:

- 6 total collisions were recorded at the intersection, resulting in a collision rate of 0.46 collisions/MEV;
- 4 collisions were classified as rear-ends, 1 collision was classified as a resulting of a turning movement conflict and the remaining collision was reported as an angle collision
- A single collision reported injuries while the remainder were property-damage-only (PDO); and
- Only a single collision involved a truck and trailer vehicle.

A review of the available collision information indicated that there appears to be no discernable pattern given the incidence of collisions over the 5-year period.

1.3 PLANNED CONDITIONS

Planned Transportation Network Changes

A review of the City of Ottawa's documents[1] indicated that:

- Bank Street from Leitrim Road to south of Rideau Road is scheduled for widening from 2-to-4 lanes in two separate phases over the next decade;
- The widening and realignment of Earl Armstrong Road from west of Albion Road to Hawthorne Road could occur beyond the 2031 Transportation Master Plan horizon, as this improvement is described within the 2031 Network Concept;

1. City of Ottawa Transportation Master Plan (Nov. 2013) Map 11 (Road Network Affordable Transportation Network), Map 5 (Rapid Transit and Transit Priority Network – 2031 Affordable Network), Appendix "E" of the 2019 DC Background Study and other planning documents

The widening of Bank Street, and potential improvements at the Bank Street/Rideau Road intersection, could result in minor changes to the traffic patterns within the study area as additional traffic shifts to the Bank Street corridor.

The Earl Armstrong realignment, should it be implemented, could result in a shift in traffic away from Rideau Road. However, the timing of this improvement is largely unknown and is well beyond the scope of this traffic study.

No changes are proposed to the existing traffic volumes to account for the above network improvements.

Other Adjacent Development Initiatives

A review of adjacent developments planned within the immediate study area was undertaken as part of this study:

- ***300 Somme Street***: Located within Block 6 of the Tomlinson Hawthorne Industrial Park subdivision, the 300 Somme Street development is approximately 17.8 hectares in size. The development proposes a combined 740 m^2 office and 454 m^2 warehouse with the remaining land serving as temporary outdoor vehicle storage yard with stalls for tractor trailer storage (15.6m). The site would provide two, one-way accesses along Somme Street located 145m and 210m east of Sappers Ridge opposite the Fastfrate development;
- ***35 Sappers Ridge:*** The 35 Sappers Ridge development proposals 16 commercial units on three separate pads, totalling 2,300 m^2 gross floor area of commercial development. A single access is proposed from Sappers Ridge;
- ***581 Somme Street (Includes 601 Somme and 5123 Hawthorne):*** The 581 Somme Street proposes a new Techo-Bloc warehouse, showroom and accessory office building for a landscape business totalling approximately 370 m^2;
- ***631 Somme Street:*** The 631 Somme Street development proposes 12 mini-storage warehouse buildings and 83 m^2 of office space. The total floor area of the development is proposed to be approximately 3,850 m^2.

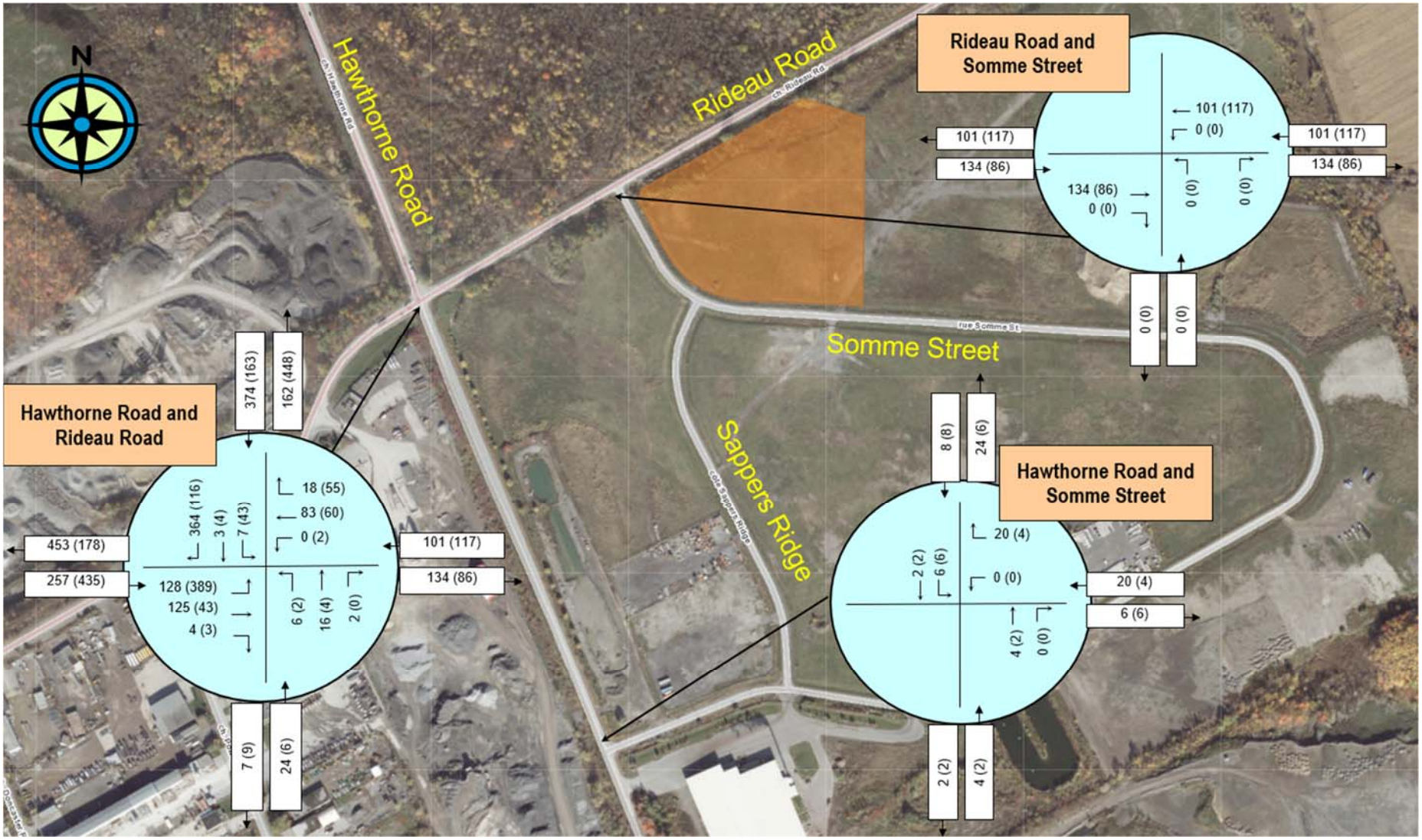


Exhibit 1-3: Existing (2021) Morning and Afternoon Peak Hour Traffic Volumes – Morning (Afternoon) – Vehicles-Per-Hour

2.0 STUDY AREA AND TIME PERIODS

2.1 STUDY AREA

A review of the Screening Form indicated that the proposed Fastfrate warehouse development does not meet the trip generation trigger, therefore the traffic study is limited to the "Design Review" component.

The study area is proposed to include Rideau Road and Somme Street fronting the site and the following key intersections:

- Hawthorne Road / Rideau Road (all-way STOP-controlled);
- Rideau Road / Sappers Ridge (minor leg STOP-controlled); and
- Hawthorne Road/Somme Street (minor leg STOP-controlled).

2.2 TIME PERIODS

The study will analyze the morning and afternoon peak hours of travel demand as they were envisioned to represent the "worst-case" scenario in terms of traffic volumes.

2.3 HORIZON YEARS

To meet the expectations of a Design Review TIA, the analysis would consider the build-out/first year of operations horizon year assumed to be 2022.

3.0 EXEMPTION REVIEW

Table 3.1 is an extract from the TIA Guidelines (2017) in regard to possible reduction in scope of work of the traffic study.

Castleglenn would request the City of Ottawa to provide exemptions for Elements 4.1.3, 4.2.2 and all elements related to the Network Impact Component (Modules 4.5, 4.6 and 4.8).

Table 3-1: Exemptions as per TIA Guidelines

Module	Element	Exemption Considerations	Include Module in TIA
Design Review Component			
4.1 Development Design	**4.1.2 Circulation and Access**	Required for site plan.	Yes
	4.1.3 New Street Networks	Only required for plans of subdivision	No
4.2 Parking	**4.2.1 Parking Supply**	Required for site plan.	Yes
	4.2.2 Spillover Parking	Parking supply not anticipated to be deficient	No
Network Impact Component			
4.5 Transportation Demand Management	**All elements**	Network Review components not required.	No
4.6 Neighbourhood Traffic Management	**4.6.1 Adjacent Neighbourhoods**		
4.8 Network Concept			

4.0 FORECASTING

4.1 DEVELOPMENT-GENERATED TRAVEL DEMAND

4.1.1 Trip Generation

The Fastfrate warehouse facility is anticipated to operate with a single shift composed of dock workers, office works and truck drivers. Based on previous operating experience, the following number of operations are anticipated:

- 30 employees combined located in both the warehouse and office space; and
- 30 trucks to the receiving docks and 30 trucks to the outbound, some of which are anticipated to be common trips where a driver completes more than one trip per day.

Therefore, daily truck travel could range from 60-to-120 two-way trips depending on the flow of inbound and outbound trailers. It has been assumed that, as a worst case, only 50% of inbound trailers are loaded as outbound trailers, resulting in 90 two-way truck trips during a 10-hour shift. This would result in 4-to-5 trucks in and out during the morning and afternoon peak hours of travel demand.

The site trip generation rate related to employee travel has been determined through first principles and the following assumptions from the "*Tomlinson Hawthorne Industrial Subdivision Transportation Brief*" (IBI, Feb. 2009):

- 10% employee absenteeism rate;
- 60% of employees travel to work in the AM, 50% of the employees travel from work in the PM;
- A 90 / 10 inbound-outbound split in the AM and a 75 / 25 inbound-outbound split in the PM.

The site location limits the opportunities for active modes and public transportation. For a worst-case scenario, no additional mode share has been applied.

Table 4-1 summarizes the number of peak hour employee vehicles and delivery vehicles accessing the site on a typical day.

Table 4-1: 310 Somme Street Site Generated Traffic

Travel Mode	*Morning Peak Hour (person trips/hr)*			*Afternoon Peak Hour (person trips/hr)*		
	In	*Out*	*Total*	*In*	*Out*	*Total*
Site Employee Trips Passenger Vehicles	14	2	16	4	11	14
Warehouse Delivery Trips	5	4	9	4	5	9
Total	**19**	**6**	**25**	**8**	**16**	**21**

4.1.2 Trip Distribution and Assignment

The traffic distribution has been developed in review of the 2011 TRANS Origin-Destination study for the Southeast Rural Zone and of the report *"Tomlinson Hawthorne Industrial Subdivision – Transportation Brief for R.W. Tomlinson Ltd."* (February, 2009).

Table 4-2 summarizes the traffic distribution adopted for the proposed site and adjacent development traffic.

Table 4-2: Traffic Distribution

To/From	*Residential Traffic Distribution*
North	60%
East	10%
West	30%
South	N/A

4.1.3 Trip Assignment

Exhibit 4-1 illustrates the traffic assignment to the adjacent study area intersections assuming full build-out of the proposed development. The following assumptions were made to assign traffic to the two subdivision access locations:

- Employee site generated traffic was entirely assigned to/from the Rideau Road/Somme Street intersection. This traffic has been assumed to be primarily employee vehicles and small vehicle deliveries, as large vehicles would be required to use the Hawthorne access; and
- The remaining traffic attributed to delivery truck traffic has been assigned to/from the Hawthorne Road/Somme Street intersection, which would be primarily composed of heavy tractor trailer traffic.

4.1.4 Site Traffic Volumes

Exhibit 4-1 illustrates the full build-out traffic assigned to the adjacent roadway network by the proposed 301 Somme Street warehouse development. The exhibit illustrates the forecast morning and afternoon peak hour of traffic.

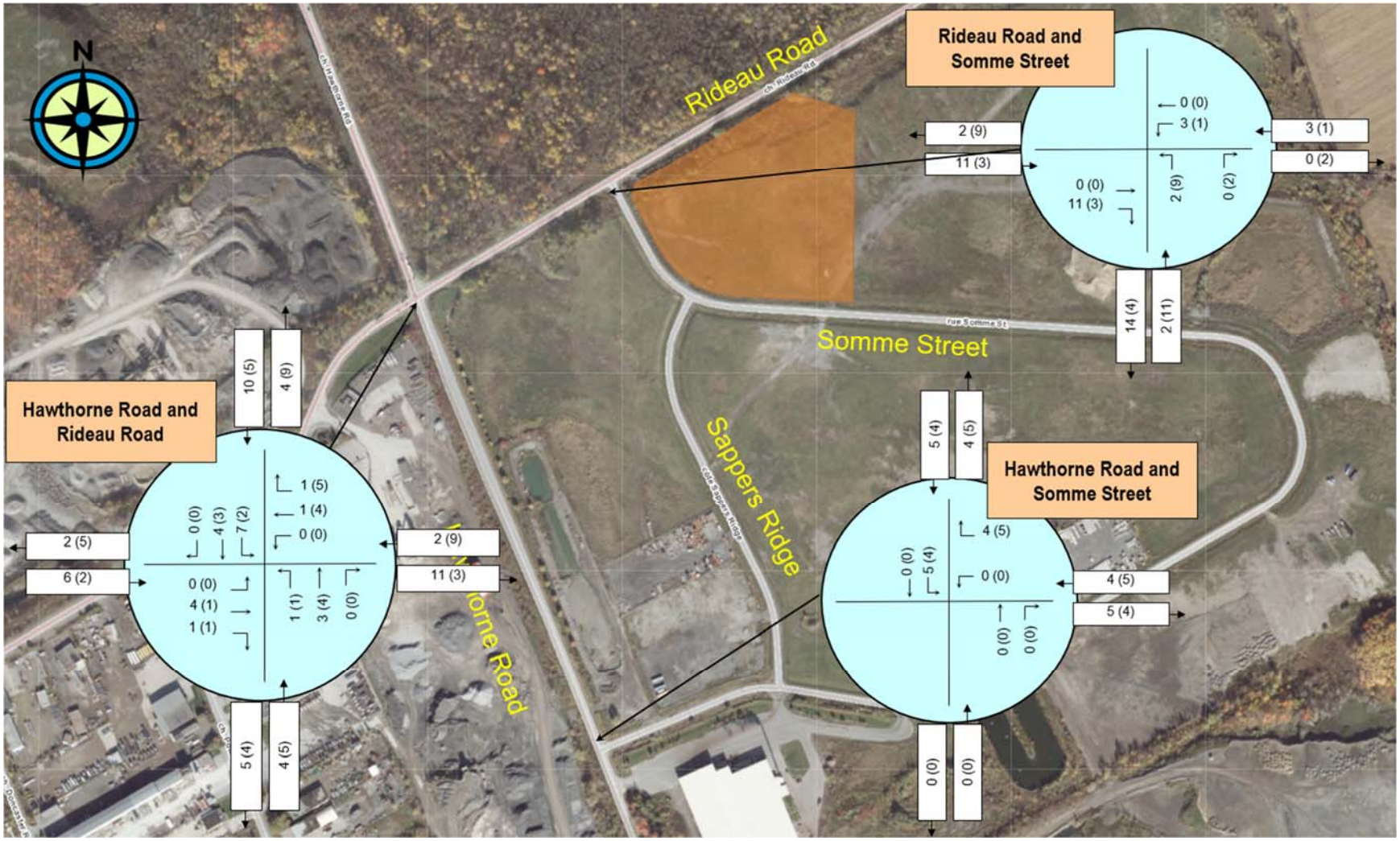


Exhibit 4-1: Proposed Development Build-Out Traffic Volumes – AM (PM)

5.0 BACKGROUND NETWORK TRAFFIC

5.1 HISTORICAL BACKGROUND GROWTH RATE

The City of Ottawa TRANS Regional Model outputs were reviewed to estimate forecast traffic growth along Hawthorne Road and Rideau Road.

The following 2011 and 2031 AM screenlines were reviewed and tabulated for a projected annual growth rate:

- The SL8 Screenline (River Road, Albion Road, Bank Street and Hawthorne Road) was found to provide a 3.6% annual growth rate in the northbound peak direction; and
- the SL52 Screenline (Leitrim Rd, Louiseize Rd, Rideau Road and Mitch Owens Road) was found to provide a 3.2% growth in the eastbound peak direction.

To avoid double counting future development within the Tomlinson Industrial Park, a general 3% background annual growth rate has been applied to the north, east and west legs of the Hawthorne Road/Rideau Road intersection.

5.2 SURROUNDING DEVELOPMENT TRAFFIC GENERATION

Section 1.3 identified 4 developments within the Tomlinson Hawthorne development that are likely to be occupied by the time of buildout for the proposed development. A review of the development information has indicated that traffic impact assessments are not available for these developments.

Table 5-1 summarizes the trip generation rates adopted for the adjacent study area developments. A "High Turn Over Restaurant" was considered a worst-case generation for the ground floor of each mixed-use building along Manotick Main Street.

Table 5-1: Trip Generation Rates adopted for Adjacent Developments

Land Use	*Source*	*Independent Variable*	*Morning Peak Hour*			*Afternoon Peak Hour*		
			Rate/Equation	*In*	*Out*	*Rate/Equation*	*In*	*Out*
Business Park	ITE - Land Use 770	Gross Floor Area (1000 ft2)	0.4	61%	39%	0.42	46%	54%
Building Materials and Lumber Store	ITE - Land Use 812	Gross Floor Area (1000 ft2)	1.57	63%	37%	2.06	47%	53%
Warehouse	ITE - Land Use 150	Gross Floor Area (1000 ft2)	0.12(X) + 25.32	77%	23%	0.12(X)+27.82	28%	72%
Small Office	ITE - Land Use 713	Gross Floor Area (1000 ft2)	1.92	83%	17%	2.45	68%	32%
Mini Warehouse	ITE - Land Use 151	Gross Floor Area (1000 ft2)	0.1	60%	40%	0.17	47%	53%

Table 5-2 indicates the anticipated forecast auto trips generated by the adjacent developments on the surrounding transportation network. This analysis assumes negligible internal capture rates, pass-by rates and alternative mode shares that could further limit the overall impact of each adjacent development on the surrounding network.

illustrates the combined adjacent development traffic forecast from the Tomlinson Hawthorne Industrial Development area. The distribution and assignment of the background traffic was undertaken following the methods described within *"Tomlinson Hawthorne Industrial Subdivision – Transportation Brief for R.W. Tomlinson Ltd."* (February, 2009).

Table 5-2: Adjacent Development Forecast Trip Generation

300 Somme Street								
Land Use	***Source***	***Size***	***Morning Peak Hour (veh/hr)***			***Afternoon Peak Hour (veh/hr)***		
			In	***Out***	***Total***	***In***	***Out***	***Total***
Warehouse	ITE - Land Use 150	4,900 sq. ft.	20	6	26	8	20	28
Small Office	ITE - Land Use 713	8,000 sq. ft.	13	3	16	14	6	20
Total			**33**	**9**	**42**	**22**	**26**	**48**
35 Sappers Ridge								
Land Use	***Source***	***Size***	***Morning Peak Hour (veh/hr)***			***Afternoon Peak Hour (veh/hr)***		
			In	***Out***	***Total***	***In***	***Out***	***Total***
Business Park	ITE - Land Use 770	24,750 sq. ft.	7	3	10	5	6	11
Total			**7**	**3**	**10**	**5**	**6**	**11**
581 Somme Street								
Land Use	***Source***	***Size***	***Morning Peak Hour (veh/hr)***			***Afternoon Peak Hour (veh/hr)***		
			In	***Out***	***Total***	***In***	***Out***	***Total***
Building Materials and Lumber Store	ITE - Land Use 812	4,000 sq. ft.	4	3	7	4	5	9
Total			**4**	**3**	**7**	**4**	**5**	**9**
631 Somme Street								
Land Use	***Source***	***Size***	***Morning Peak Hour (veh/hr)***			***Afternoon Peak Hour (veh/hr)***		
			In	***Out***	***Total***	***In***	***Out***	***Total***
Mini Warehouse	ITE - Land Use 151	41,500 sq. ft.	3	2	5	4	4	8
Total			**3**	**2**	**5**	**4**	**4**	**8**
Total Background Traffic Volumes			**47**	**17**	**64**	**35**	**41**	**76**

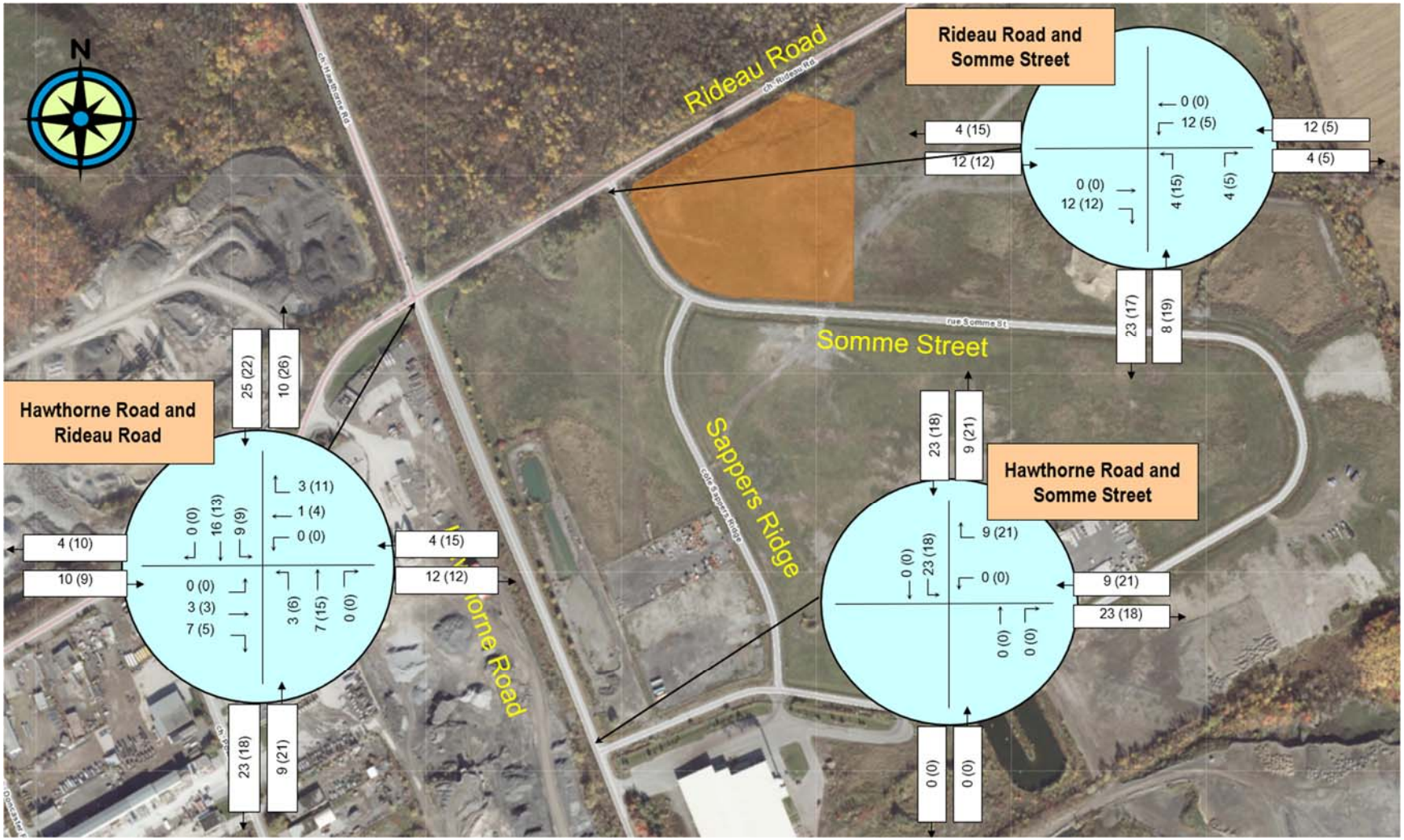


Exhibit 5-1: Combined Adjacent Background Development Traffic from Hawthorne Industrial Park Developments
Morning (Afternoon) Peak Hour

6.0 DEMAND RATIONALIZATION

This section rationalizes the assumed future travel demands for the study area to determine if there are any auto capacity limitations of the transportation network. This section includes an intersection capacity analysis of existing conditions and background 2022 conditions to identify future transportation network constraints.

Appendix "F" provides the Synchro™ printouts for the study area intersections assuming existing (2021) and 2022 forecast background conditions.

6.1 REVIEW OF EXISTING NETWORK CONSTRAINTS

Table 6-1 summarizes the existing (2021) intersection capacity analysis undertaken with Synchro™ 10 traffic software for the two existing STOP-controlled intersections within the study area. A peak-hour-factor of 0.95 was assumed for both existing and future conditions.

Inspection of the table was found to indicate that no capacity constraints are evident within the existing network. All intersections are anticipated to operate with auto LOS equal to or better than "C".

Table 6-1: Existing (2021) Intersection Capacity Analysis – Critical Movement Summary

Intersection	***Weekday AM Peak (PM Peak)***			
	Critical Movements/Approaches			
	Approach / Movement	Delay (seconds)	LOS	v/c
Hawthorne Road / Rideau Road	***EB Approach (EB Approach)***	13 (16)	B (C)	0.42 (0.63)
	SB Approach (SB Approach)	12 (10)	B (A)	0.48 (0.24)
Hawthorne Road / Somme Street	***WB Approach (WB Approach)***	8 (9)	A (A)	0.02 (0.01)
Rideau Road / Somme Street	***Closed***	--	--	

6.2 REVIEW OF FUTURE NETWORK CONSTRAINTS – 2022 BACKGROUND

Table 6-2 summarizes the forecast background (2022) intersection capacity analysis undertaken with Synchro™ 10 traffic software for the three STOP-control intersections within the study area. A peak-hour-factor of 0.95 was assumed for both existing and future conditions.

Inspection of the table indicates that, without the development in place, the three study area intersections would operate with acceptable traffic operations of LOS "C" or better.

Table 6-2: Forecast Background (2022) Analysis – Critical Movement Summary

Intersection	***Weekday AM Peak (PM Peak)***			
	Critical Movements/Approaches			
	Approach / Movement	Delay (seconds)	LOS	v/c
Hawthorne Road / Rideau Road	***EB Approach (EB Approach)***	14 (17)	B (C)	0.46 (0.67)
	SB Approach (SB Approach)	13 (10)	B (A)	0.54 (0.24)
Hawthorne Road / Somme Street	***WB Approach (WB Approach)***	9 (9)	A (A)	0.03 (0.01)
Rideau Road / Somme Street	***NB Approach (NB Approach)***	10 (9)	A (A)	0.01 (0.01)

6.3 QUALITATIVE REVIEW OF DEVELOPMENT IMPACT

A review of the existing and future background intersection capacity analysis indicates that the existing Hawthorne Road/Rideau Road intersection and surrounding minor road intersections operate with acceptable levels of service, delay and v/c ratios. The existing transportation network is capable of accommodating additional growth.

By the 2022 horizon year, the proposed 301 Somme Street development is anticipated to generate up to 10 two-way truck trips and approximately 15 two-way employee trips during the peak hours. This level of demand is anticipated to have a negligible impact on the levels of service and volume-to-capacity of the surrounding roadway network.

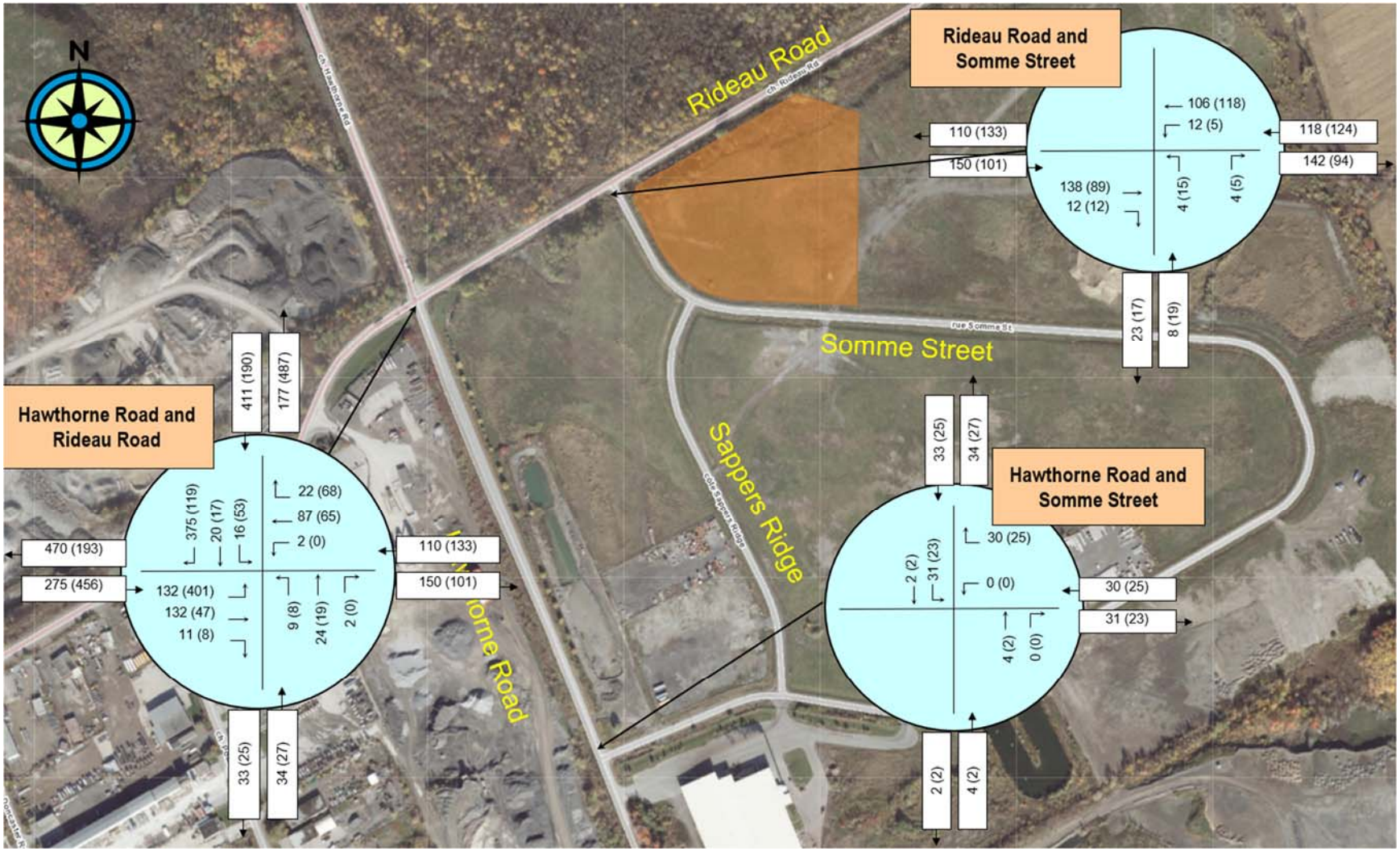


Exhibit 6-1: Total Background Traffic Forecast – Build-Out (2022) – Morning (Afternoon) Peak Hour

7.0 ANALYSIS

7.1 DEVELOPMENT DESIGN

7.1.1 Design for Sustainable Modes

The proposed 301 Somme Street warehouse development:

- Provides 4 exterior cycling stalls fronting the office area of the development;
- Provides 61 auto parking stalls fronting the office and warehouse area; and
- Provides concrete sidewalks connecting the parking area, bike stalls and the main office.

The surrounding study area does not offer any transit, pedestrian or cyclist amenities. The City of Ottawa's TDM-Supportive Development Design and Infrastructure Checklist has been completed and included with Appendix "G". The transportation network surrounding the site does not provide for transit or pedestrian amenities. However, the site does provide for a designated short-term parking area immediately fronting the office site for pick-up/drop-offs

7.1.2 Circulation and Access

The site proposes two two-way accesses to Somme Street, spaced approximately 80m apart, with the following anticipated operations:

- The east access would provide for the primary site delivery vehicle access and egress. It is anticipated that large trucks would primarily enter/exit the site from/to the east. The access provides a 70m length to store two inbound trucks on-site ahead of the gated warehouse facility and without impacting traffic flow on Somme Street. Should a truck be denied access, the vehicle parking lot is accessible and allows for a left-turn to have the truck exit via the west access;
- The west access is intended for primary employee site access/egress, for emergency truck egress, and for e-commerce vehicle egress. The access offers an approximately 30m throat length for inbound/outbound vehicles.

Site deliveries would be completed within the gated site area accessed from the east access location. Trucks would be required to check-in prior to admission at the front office and would queue on-site. The site is anticipated to offer satisfactory fire truck and delivery vehicle access, egress and circulation fronting the building.

Appendix "E" provides swept path diagrams for a WB-19 design vehicle circulating the site.

7.2 PARKING

7.2.1 Motor Vehicle Parking

Parking is to be accommodated on-site by above-ground vehicle stalls fronting the main office/e-commerce area as well as within the gated area. A total of 69 permanent parking stalls are to be made available, 61 of which are located outside the gated area. The proposed site is located in Area "D - Rural' of Schedule 1A (Zoning By-law No.2008-250). Table 7-1 summarizes the auto parking required and proposed supply for the development.

Table 7-1: Parking Requirements for the 301 Somme Street Development

Parking Type	*Rate*	*Unit*	*Parking Requirements*	*Provided Parking*
Office (Table 101)	2.4 stalls / 100m^2 of GFA	~262 m^2	7 Stalls	69 Auto Stalls
Warehouse (Table 101)	0.8 stalls / 100m^2 of GFA for first 5,000 m^2 0.4 stalls / 100m^2 for remaining	~8,425 m^2	54 Stalls	
Total Parking Stalls			**61 Stalls Required**	**69 Stalls Provided**

Table 7-1 indicates that the proposed 69 stall parking supply exceeds the minimum site parking requirement for the proposed uses. The site proposes 3 accessible vehicle parking stalls. No spillover parking is forecast to occur.

7.2.2 Bicycle Parking

As regards bicycle parking supply, a review of By-Law Section 111(2)(h) 1 stall bicycle parking stall per 2000 m^2 of warehouse and 1 stalls/250 m^2 of office space. The bylaw requirements indicate that 8 bicycle spaces would be required for the development.

The proposed site plan provides for 8 horizontal bicycle stalls located outside the office/e-commerce spacing. This remains sufficient as there does not exist significant cycling amenities in the surround transportation network that would support cycling as an active mode share.

7.3 BOUNDARY STREET DESIGN

7.3.1 Mobility – Segment MMLOS Analysis

The Multi-Modal Level-of-Service (MMLOS) guidelines were used to evaluate the segment level of service for all modes of transportations along Rideau Road and Somme Street fronting the site. The MMLOS Targets were referenced from Exhibit 22 under "All Other Designations".

Table 7-2 summarizes the segment MMLOS analysis fronting the proposed development assuming existing conditions. For the pedestrian and bike LOS analysis, the analysis has adopted the assumption that the operating speed is 10 km/hr greater than the roadway posted speed[2].

Table 7-2: Segment MMLOS Analysis

Performance Measure	***Roadway Segments Adjacent to the Development***	
	Eastbound Rideau Road	Northbound Somme Street
Pedestrian LOS (PLOS)		
Sidewalk Width (m)	0m	0m
Boulevard Width (m)	0m	0m
Operating Speed (km/h) - Posted +10 km/hr	90 km/hr	50 km/hr
Segment PLOS	**F**	**F**
Target PLOS	D	D
Bicycle LOS (BLOS)		
Bikeway Type	Mixed Traffic	Mixed Traffic
Number of Lanes per direction	2 (marked centreline)	2 (no marked centreline)
Bike Lane Width (m)	N/A	N/A
Operating Speed (km/h) Posted +10 km/hr	90 km/hr	50 km/hr
Segment BLOS	**F**	**B**
Target BLOS Spine Route	D	C
Truck LOS (TkLOS)		
Number of lanes (in each direction)	1	1
Curb Lane Width (m)	3.6	3.3
Segment TkLOS	C	D
Target TkLOS	D	No Target

Inspection of the analysis found the following sub-target facilities:

- A PLOS of "F" on both facilities due to the presence of a gravel shoulder and operating speeds greater than 30 km/hr. Given the rural nature of the area, provisions of sidewalks at this time are not considered prudent;
- A BLOS "F" along Rideau Road due to the operating speed of 90 km/hr. As a rural collector roadway, a lower speed limit is not recommended to improve BLOS;
- No transit analysis was undertaken as there are no transit routes within the study area.

No changes are recommended to improve active mode levels of service within the study area at this time given the rural and industrial nature of the area.

2 Section 2.5, "*Addendum to MMLOS Guidelines*", City of Ottawa, May 2017.

7.4 ACCESS INTERSECTIONS DESIGN

7.4.1 Location and Design of Site Access

The site proposes two two-accesses to Somme Street, spaced approximately 80m apart. In review of each access against Section 25 of the City of Ottawa's Private Approach By-Law indicates:

- Section 25(a) identifies the maximum number of approaches along a given site frontage. Somme Street provides 420m of frontage which is more than suitable for two two-way accesses;
- The east and west site accesses are approximately 40m and 29.5m, respectively. As per Section 25(e), the proposed site provides for transport loading areas, and is therefore exempt from the 9.0m width at the street line imposed by Section 25(c);
- The two proposes private approaches are separated by 80m, which is greater than the required 9.0m as per Section 25 (g);
- Section 26(m) does not apply as the property does not abut a major collector nor arterial;
- The west access provides a 12.0m spacing to the Sapper's Ridge/Somme Street intersection, which is greater than the 6.0m required by Section(o); and
- The east access provides a 5.3m separation to the adjacent property line, which is greater than the minimum of 3.0m required by Section (p).

A review of the Transportation Association of Canada (TAC) guidelines for clear throat lengths (measured from the property line to the nearest obstruction), it is desirable to achieve an 8m clear throat length for light industrial uses less than 10,000m^2 to the nearest collector roadway. Both site accesses were found to achieve the desired 8m clear throat length. The east and west access provide for a 49m and 24m clear throat length, respectively.

7.4.2 Intersection Control

Each of the site accesses would provide for STOP-control on the minor leg.

7.4.3 Subdivision Access Review

Exhibit 7-2 and Exhibit 7-1 illustrate a swept path assessment of the existing Hawthorne Road/Somme Street and Rideau Road/Somme Street intersections assuming a heavy vehicle. Inspection of the exhibits indicated that the existing intersection pavement dimensions do not facilitate effective truck turning maneuvers. As this subdivision is zoned as a "Rural Heavy Industrial Use", the intersections should best accommodate heavy truck turning maneuvers. The Hawthorne Road/Somme Street intersection is envisioned to be the primary heavy vehicle access to the subdivision. The proponent for the 310 Somme Street development has been notified that all large delivery vehicles must utilize the Hawthorne Road / Somme Street intersection and thereby access the site from the east.

To best support the future truck maneuvers, Appendix "H" provides a functional plan and turning movement diagram proposed to improve the turning radii in the northeast and southeast quadrants of the

intersection. The recommended road widening and ditch modifications are to be accommodated within the existing right-of-way.

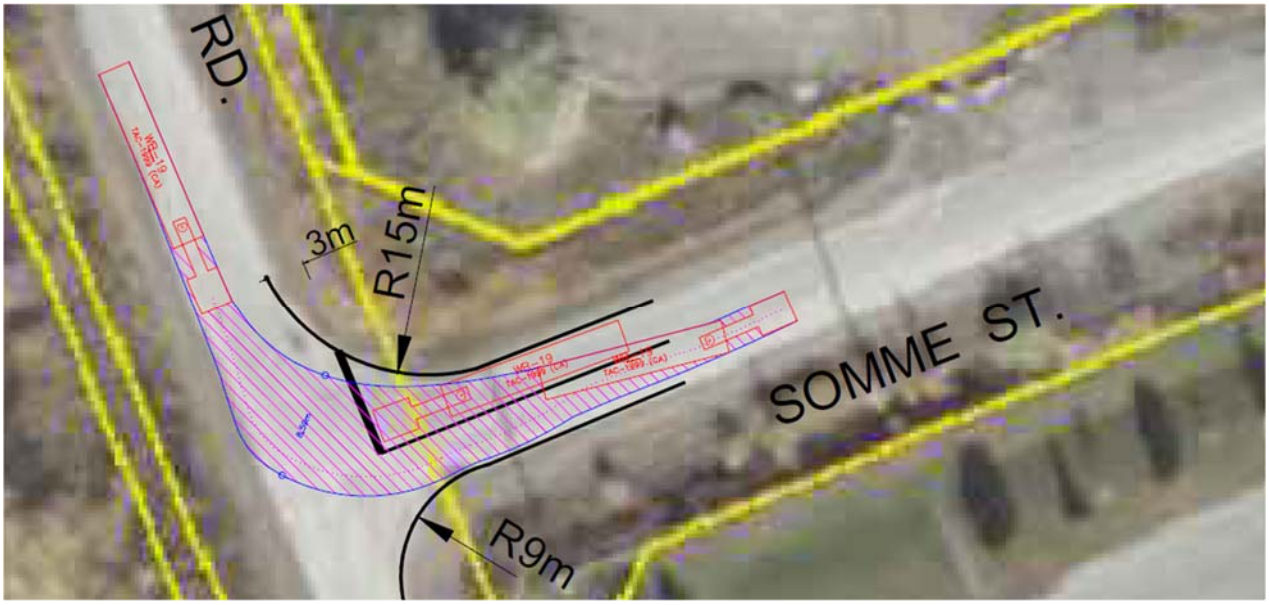


Exhibit 7-2: Existing Hawthorne Road/Somme Street Intersection Heavy Vehicle Swept Path

Exhibit 7-1: Existing Rideau Road/Somme Street Heavy Vehicle Swept Path

8.0 TIA STRATEGY

8.1 STUDY FINDINGS

A review of the Transportation Impact Assessment for the 301 Somme Street development indicated:

- The Rideau Road/Hawthorne Road would operate with acceptable levels-of-service "C" or better in the existing and 2022 forecast build-out morning and afternoon peak hours;
- The proposed development would generate between 60-and-120 truck trips per day, resulting in approximately 10-two-way truck and 15 two-way employee trips during the peak hours of travel demand. The development is anticipated to have a negligible impact on the surround roadway level of service and roadway capacity;
- The Hawthorne Road/Somme Street and Rideau Road/Somme Street intersections, with their existing configurations, do not offer satisfactory lane widths and curb radii to facilitate the movement of heavy vehicles to and from the Tomlinson Hawthorne Industrial Subdivision; and
- Improvements in the form of corner widening at the Hawthorne Road/Somme Street intersection would be required to improve inbound and outbound truck maneuvers at this intersection.

8.2 RECOMMENDED IMPROVEMENTS

It is recommended that the Hawthorne Road/Somme Street intersection be widened and improved to better facilitate heavy truck maneuvers to and from the Tomlinson Hawthorne development as per the functional plan contained within Appendix "H". This improvement effectively provides additional paved turning radii in the form of a truck apron to improve the inbound truck maneuver at the subject intersection. This improvement is recommended to be in place prior to the occupation of the 301 Somme Street development to best benefit truck safety and the rural industrial zoning of the site.

8.3 CONCLUSION

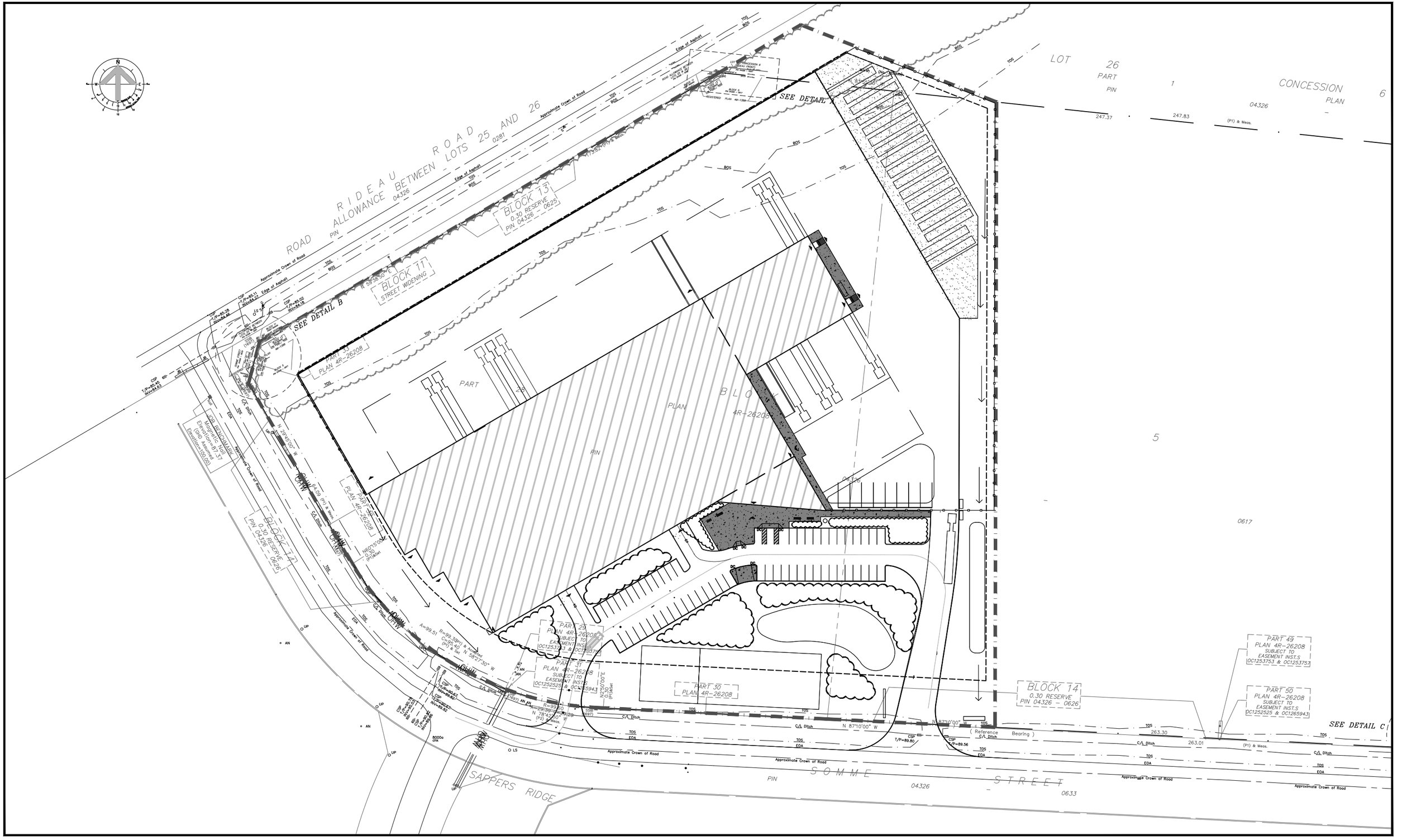
The 301 Somme Street development application proposes to develop a warehouse and e-commerce distribution facility located in the Tomlinson Heavy Industrial Subdivision. The warehouse would provide for approximately 8,425m^2 of warehousing and 260 m^2 of office development. The site proposes two new accesses along Somme Street and would afford acceptable parking amenities.

Yours truly,

Mr. Arthur Gordon B.A. P.Eng
Principal Engineer
Castleglenn Consultants Inc.

Mr. Jake Berube, P.Eng
Transportation Engineer
Castleglenn Consultants Inc.

APPENDIX A: SITE PLAN



CIVITAS GROUP
ARCHITECTURE & LANDSCAPE ARCHITECTURE

DRAWING TITLE: SITE PLAN

SCALE:1: 200

PROJECT NORTH:

TRUE NORTH:

PROJECT TITLE: CBRE FASTFRATE FACILITY

CLIENT PROJECT # 119011

PROJECT # CAI 2001

DRAWING NO. A1.0

APPENDIX B: CERTIFICATION FORM FOR TIA STUDY PROJECT MANAGER

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering ☐ or transportation planning ☐.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at Ottawa (City) this 16 day of December, 20 20.

Name: Arthur Gordon
(Please Print)

Professional Title: Principal Engineer

Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: Sutie 200 - 2460 Lancaster Road
City / Postal Code: Ottawa / K1B 4S5
Telephone / Extension: 613 - 731 - 4052
E-Mail Address: agordon@castleglenn.ca

Stamp

APPENDIX C: SCREENING FORM

Castleglenn Consultants
Engineers, Project Managers & Planners

2460 Lancaster Road, Suite 200,
Ottawa, Ontario, K1B 4S5
Tel: 613-731-4052

City of Ottawa 2017 TIA Guidelines Screening Form

Mr. Mike Giampa February 08, 2021
Project Manager, City of Ottawa
110 Laurier Avenue West,
Ottawa, ON, K1G 6J9

Please find below the completed screening form for the proposed warehouse development at 310 Somme Street near the intersection of Hawthorne Road and Rideau Road, in the lands designated as the Tomlinson Hawthorne Industrial Park.

The development proposes a 83,110 sq.ft (7,724 m^2) warehouse development and 2,900 sq. ft (270 m^2) adjoined office space.

In summary, the proposed 310 Somme Street development is anticipated to generate less than 60 person/trips in the peak hour of travel demand. The site was found to meet the safety trigger as Rideau Road is a posted 80 km/hr roadway and safety concerns have been identified at the intersection of Rideau Road and Hawthorne Road.

1. Description of Proposed Development

Municipal Address	310 Somme Street, Ottawa
Description of Location	Located east of the intersection of Rideau Road and Hawthorne Road within the Tomlinson Hawthorne Industrial Subdivision
Land Use Classification	Warehouse
Development Size (units)	N/A
Development Size (m^2)	7,724 m^2 of Warehouse Development 270 m^2 of office space
Number of Accesses and Locations	2 accesses from Somme Street East access intended for inbound and outbound trucks West access intended for passenger vehicles, sprinter van e-commerce deliveries and emergency truck egress
Phase of Development	Submission of Site Plan Control Application
Buildout Year	2022 (Anticipated)

Castleglenn Consultants
Engineers, Project Managers & Planners

2460 Lancaster Road, Suite 200,
Ottawa, Ontario, K1B 4S5
Tel: 613-731-4052

2. Trip Generation Trigger

The proposed warehouse development size is approximately 83,110 square feet (Approx 7,724m^2). There is an attached office space of 2,900 square feet intended for up to 16 office workers.

Assuming the fitted ITE curve rate for Land Use 150, the warehouse development would generate:

- 35 trip ends (27 inbound, 8 outbound) during the morning peak hour of the warehouse site; and
- 38 vehicle trip ends (9 inbound, 26 outbound) during the afternoon peak hour of the warehouse site;

Land Use 150 indicates a warehouse may also include office and maintenance areas. For the purpose of this study, the office trip generation is provided separately to develop a conservative trip generation estimate.

Assuming the average ITE rate for Land Use 712: Small Office Building, the office would generate:

- 6 trip ends (5 inbound, 1 outbound) during the morning peak hour of the office site; and
- 7 vehicle trip ends (2 inbound, 5 outbound) during the afternoon peak hour of the office site;

Therefore, the site would generate 41-to-45 vehicle trips during the peak hours of travel demand. Given the industrial nature of the site and the current lack of transit provisions to the area, it is anticipated that the majority of vehicle trips would be made by passenger vehicle. Assuming even a conservative 10% non-auto mode share and a 1.15 auto-occupancy results in approximately 52-to-57 person trips in the peak hour, below the 60 person-trip thresholds denoted within the City of Ottawa's 2017 TIA Guidelines to meet the Trip Generation trigger.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone? *		X

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

The development proposes a new access to Somme Street, which is a local road within the subdivision. The development is not located within a DPA or TOD.

Castleglenn Consultants
Engineers, Project Managers & Planners

2460 Lancaster Road, Suite 200,
Ottawa, Ontario, K1B 4S5
Tel: 613-731-4052

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?	X	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		X
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	X	
Does the development include a drive-thru facility?		X

Rideau Road is posted at 80 km/hr and forms the north boundary of the propose site.

The previous Tomlinson Hathorne Industrial Parking Transportation Brief (McCormick Rankin Corporation, Feb. 2009) identified deficient sight lines and poor grades at the intersection of Rideau Road and Hawthorne Road.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		X
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?	X	

Please review the above screening form information and let us know if you have any comments.

Yours truly,

Mr. Arthur Gordon B.A. P.Eng
Principal Engineer
Castleglenn Consultants Inc.

Mr. Jake Berube I .Eng
Transportation Engineer
Castleglenn Consultants Inc.

APPENDIX D: EXISTING TRAFFIC VOLUMES AND COLLISIONS

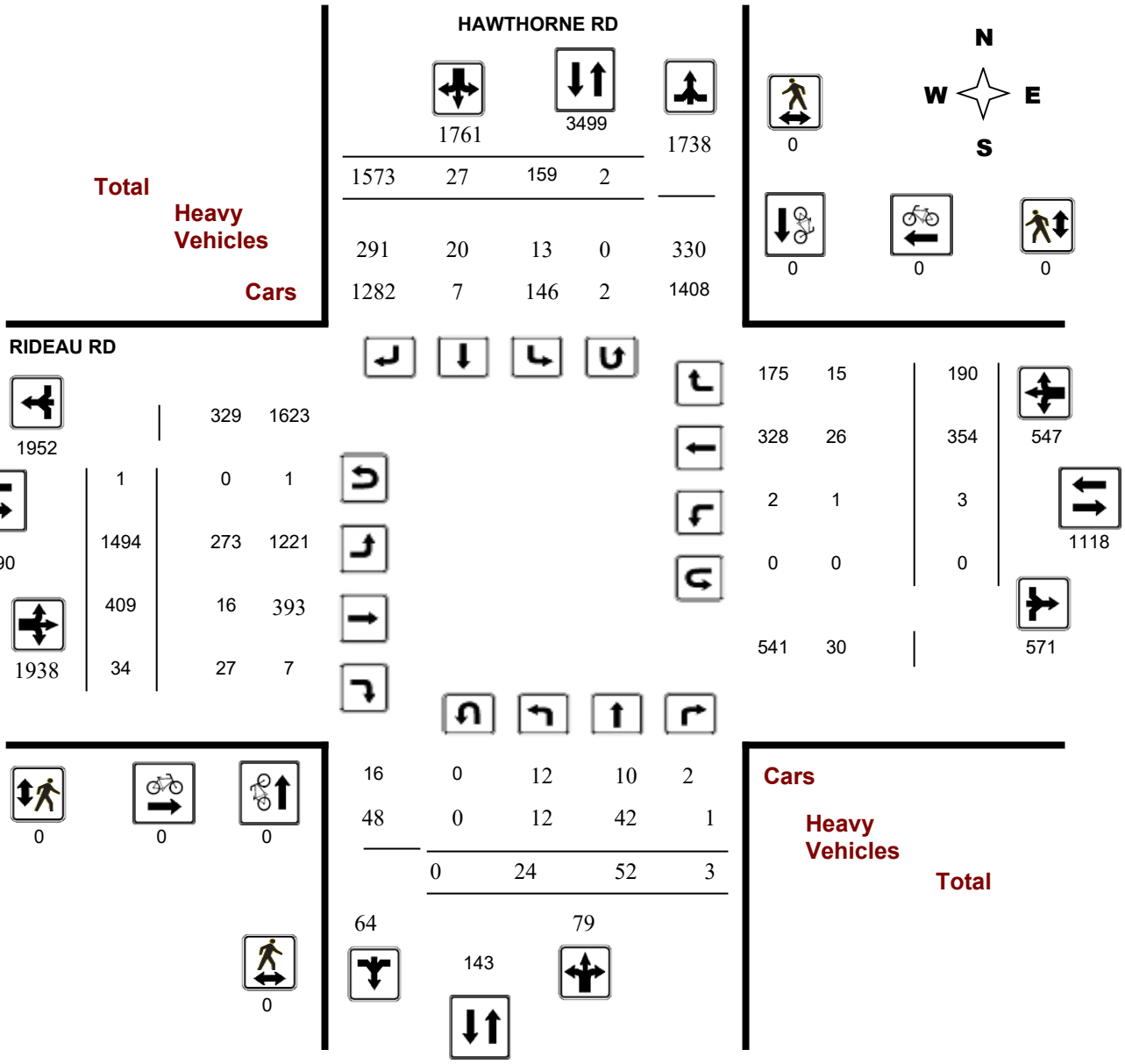
Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019
Start Time: 07:00
WO No: 38440
Device: Miovision

Full Study Diagram



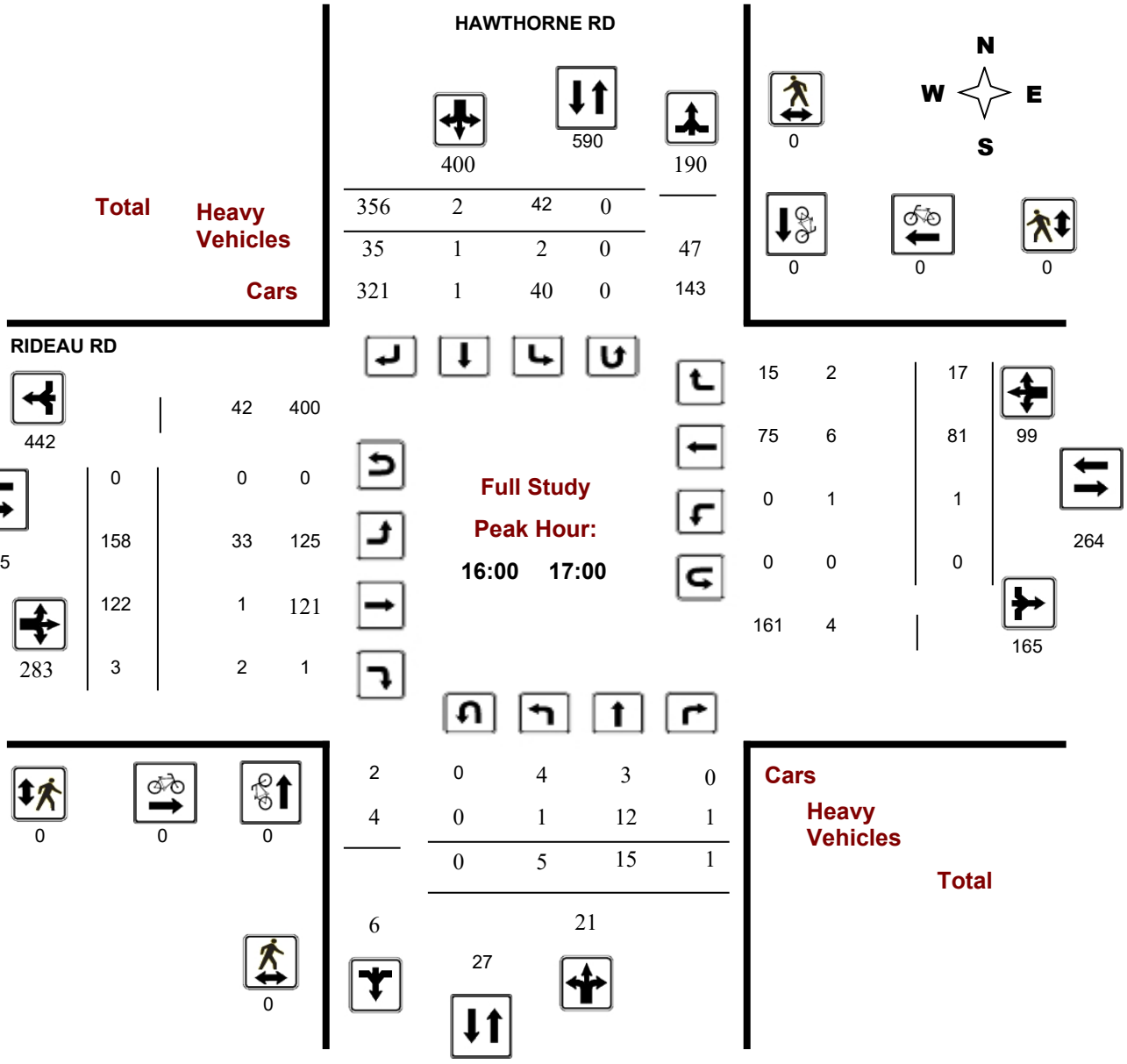
Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019
Start Time: 07:00
WO No: 38440
Device: Miovision

Full Study Peak Hour Diagram



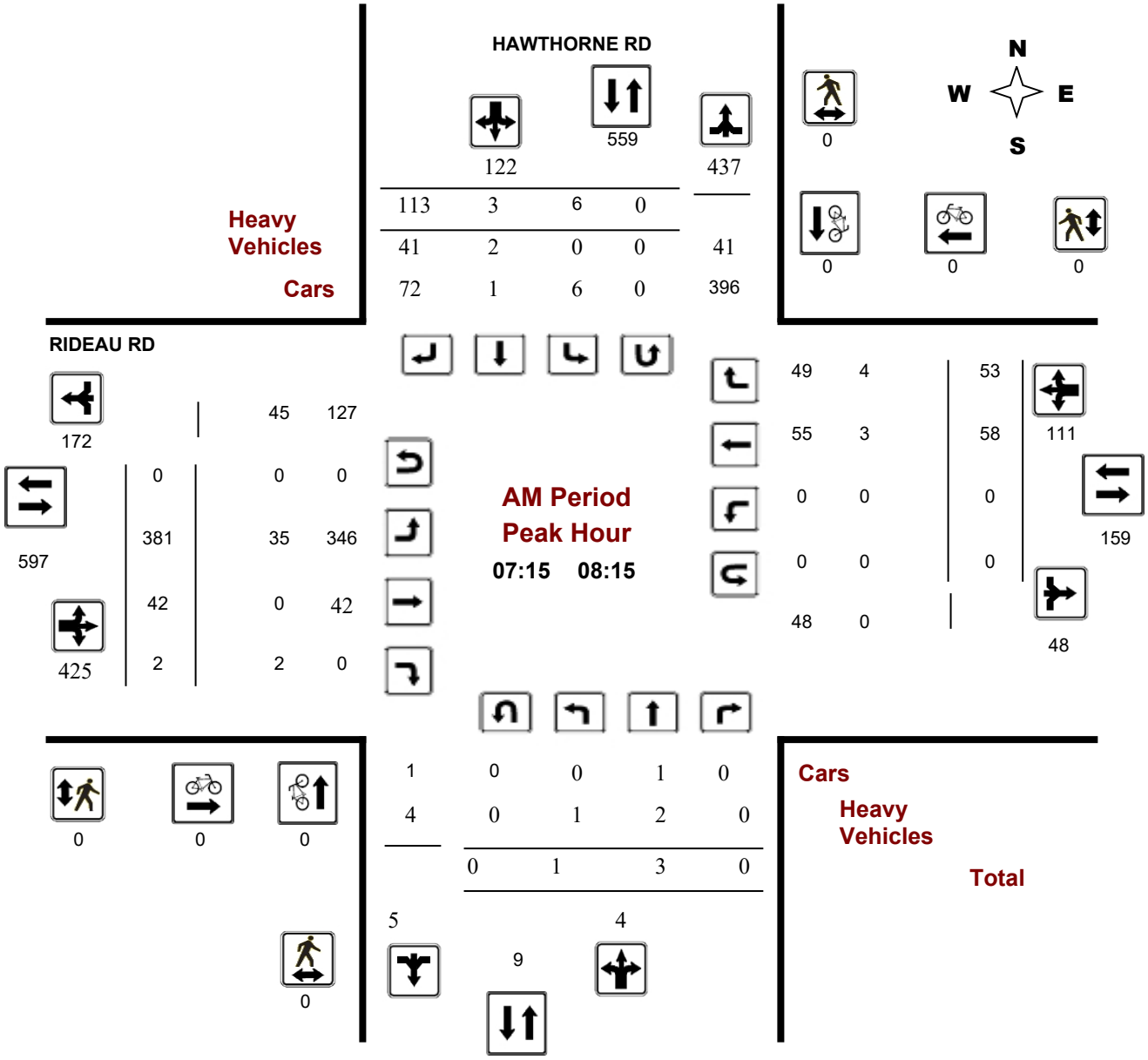
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision



Comments

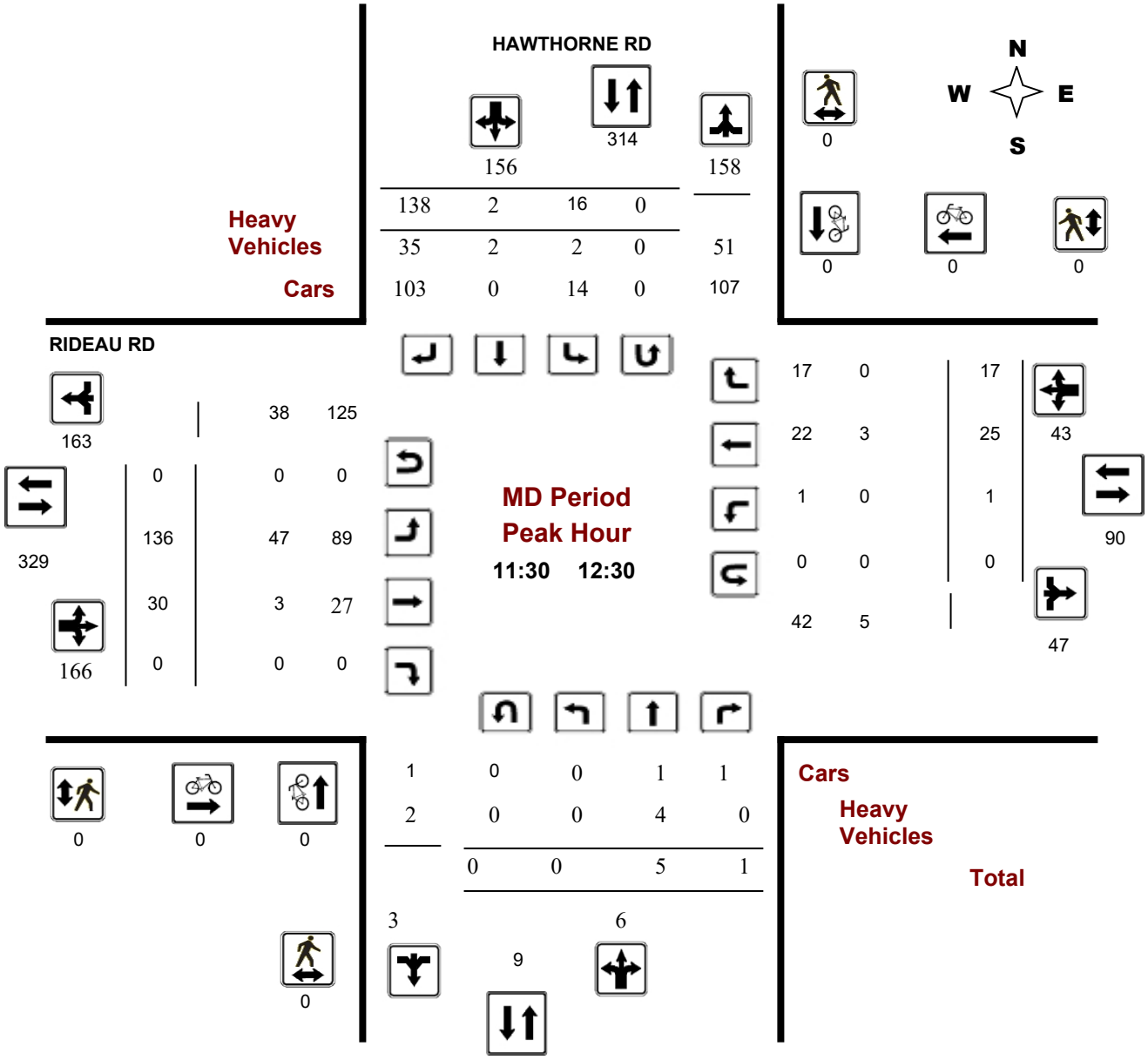
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision



Comments

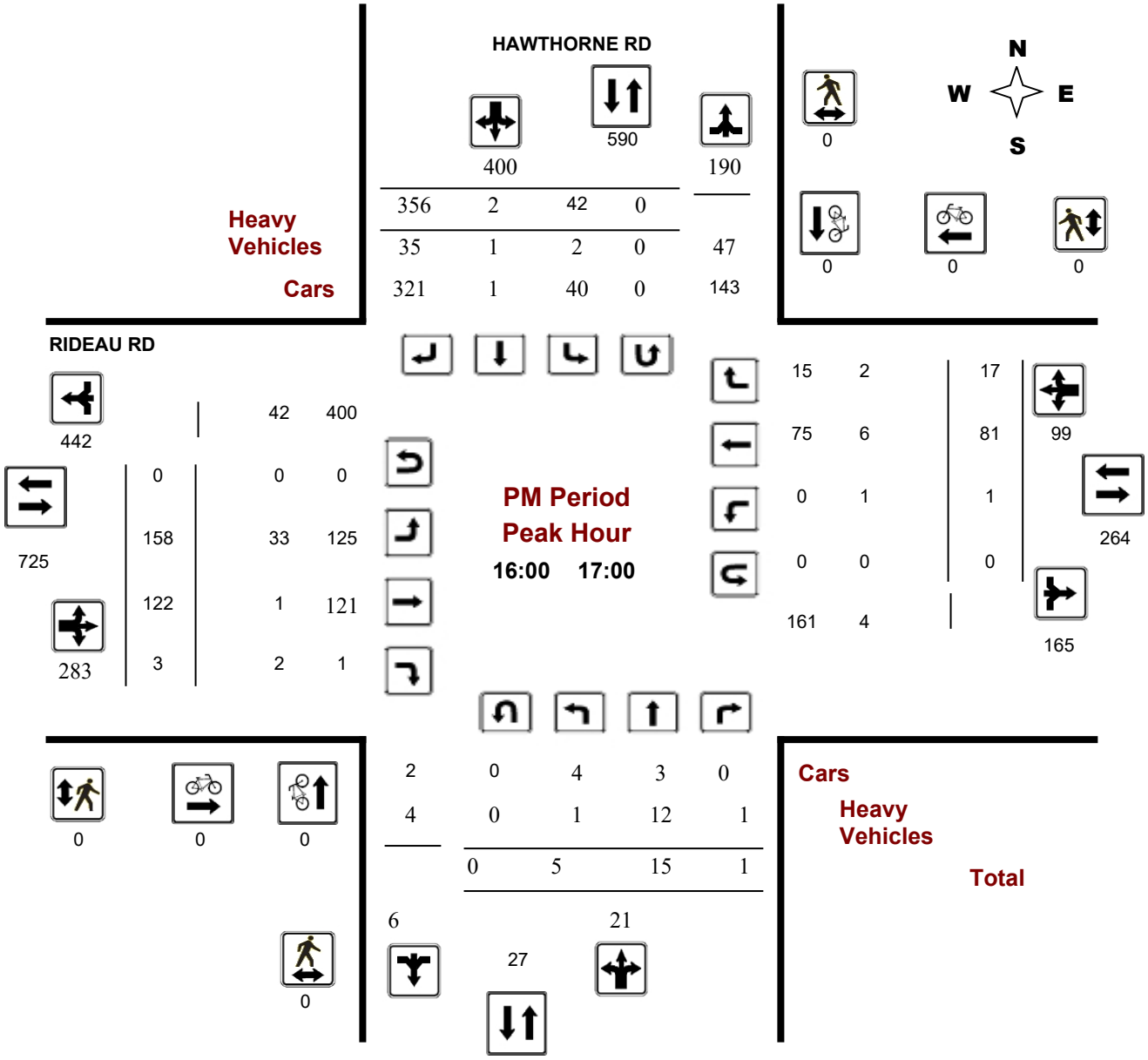
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, February 28, 2019

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 1 Westbound: 0

AADT Factor

.90

	HAWTHORNE RD								RIDEAU RD									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	4	3	0	**7**	6	1	114	**121**	**128**	376	30	2	**408**	0	63	57	**120**	**528**	**656**
08:00 09:00	1	5	0	**6**	9	6	114	**129**	**135**	300	46	2	**348**	0	51	39	**90**	**438**	**573**
09:00 10:00	2	3	0	**5**	8	3	118	**129**	**134**	151	21	3	**175**	1	29	25	**55**	**230**	**364**
11:30 12:30	0	5	1	**6**	16	2	138	**156**	**162**	136	30	0	**166**	1	25	17	**43**	**209**	**371**
12:30 13:30	2	5	0	**7**	17	4	136	**157**	**164**	116	18	5	**139**	0	14	13	**27**	**166**	**330**
15:00 16:00	9	15	0	**24**	32	7	310	**349**	**373**	143	62	19	**224**	0	50	7	**57**	**281**	**654**
16:00 17:00	5	15	1	**21**	42	2	356	**400**	**421**	158	122	3	**283**	1	81	17	**99**	**382**	**803**
17:00 18:00	1	1	1	**3**	29	2	287	**318**	**321**	114	80	0	**194**	0	41	15	**56**	**250**	**571**
Sub Total	24	52	3	**79**	159	27	1573	**1759**	**1838**	1494	409	34	**1937**	3	354	190	**547**	**2484**	**4322**
U Turns	0			**0**	2			**2**	**2**	**1**			**1**	0			**0**	**1**	**3**
Total	24	52	3	**79**	161	27	1573	**1761**	**1840**	1495	409	34	**1938**	3	354	190	**547**	**2485**	**4325**
EQ 12Hr	33	72	4	**109**	224	38	2186	**2448**	**2557**	2078	569	47	**2694**	4	492	264	**760**	**3454**	**6011**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	30	65	4	**99**	202	34	1967	**2203**	**2302**	1870	512	42	**2424**	4	443	238	**685**	**3109**	**5411**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	39	85	5	**129**	265	45	2577	**2887**	**3016**	2450	671	55	**3176**	5	580	312	**897**	**4073**	**7089**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		HAWTHORNE RD									RIDEAU RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	3	1	0	4	2	0	26	28	**32**	76	4	0	80	0	17	18	35	**115**	**147**
07:15	07:30	0	0	0	0	3	1	25	29	**29**	107	8	1	116	0	14	17	31	**147**	**176**
07:30	07:45	1	0	0	1	0	0	37	37	**38**	103	9	1	113	0	14	12	26	**139**	**177**
07:45	08:00	0	2	0	2	1	0	26	27	**29**	91	9	0	100	0	18	10	28	**128**	**157**
08:00	08:15	0	1	0	1	2	2	25	29	**30**	80	16	0	96	0	12	14	26	**122**	**152**
08:15	08:30	1	1	0	2	5	2	28	35	**37**	78	9	0	87	0	9	9	18	**105**	**142**
08:30	08:45	0	3	0	3	1	2	29	32	**35**	80	7	2	89	0	14	11	25	**114**	**149**
08:45	09:00	0	0	0	0	1	0	32	33	**33**	62	14	0	76	0	16	5	21	**97**	**130**
09:00	09:15	0	1	0	1	0	0	36	36	**37**	46	3	0	49	1	7	7	15	**64**	**101**
09:15	09:30	1	0	0	1	5	0	29	34	**35**	40	7	2	49	0	7	4	11	**60**	**95**
09:30	09:45	1	1	0	2	2	1	25	28	**30**	32	7	1	40	0	9	7	16	**56**	**86**
09:45	10:00	0	1	0	1	1	2	28	31	**32**	33	4	0	37	0	6	7	13	**50**	**82**
11:30	11:45	0	1	0	1	6	1	32	39	**40**	44	7	0	51	1	8	8	17	**68**	**108**
11:45	12:00	0	2	1	3	2	1	33	36	**39**	25	6	0	31	0	3	3	6	**37**	**76**
12:00	12:15	0	2	0	2	5	0	29	34	**36**	46	8	0	54	0	10	5	15	**69**	**105**
12:15	12:30	0	0	0	0	3	0	44	47	**47**	21	9	0	30	0	4	1	5	**35**	**82**
12:30	12:45	1	0	0	1	3	0	35	38	**39**	31	6	1	38	0	4	3	7	**45**	**84**
12:45	13:00	1	2	0	3	5	1	32	38	**41**	33	2	3	38	0	5	5	10	**48**	**89**
13:00	13:15	0	1	0	1	3	2	34	39	**40**	23	3	1	27	0	2	1	3	**30**	**70**
13:15	13:30	0	2	0	2	6	1	35	42	**44**	29	7	0	36	0	3	4	7	**43**	**87**
15:00	15:15	2	2	0	4	10	2	45	57	**61**	36	6	10	52	0	10	3	13	**65**	**126**
15:15	15:30	0	5	0	5	11	1	78	90	**95**	29	20	4	53	0	10	1	11	**64**	**159**
15:30	15:45	4	5	0	9	8	3	97	108	**117**	37	18	1	56	0	15	0	15	**71**	**188**
15:45	16:00	3	3	0	6	4	1	90	95	**101**	41	18	4	63	0	15	3	18	**81**	**182**
16:00	16:15	0	7	1	8	10	0	101	111	**119**	38	33	0	71	1	15	4	20	**91**	**210**
16:15	16:30	4	3	0	7	15	0	82	97	**104**	43	23	1	67	0	28	4	32	**99**	**203**
16:30	16:45	1	3	0	4	8	1	78	87	**91**	43	36	2	81	0	14	4	18	**99**	**190**
16:45	17:00	0	2	0	2	9	1	95	105	**107**	34	30	0	64	0	24	5	29	**93**	**200**
17:00	17:15	0	0	0	0	10	1	76	87	**87**	35	33	0	68	0	10	6	16	**84**	**171**
17:15	17:30	0	1	1	2	4	1	71	76	**78**	33	23	0	56	0	18	3	21	**77**	**155**
17:30	17:45	1	0	0	1	7	0	85	92	**93**	21	11	0	32	0	8	3	11	**43**	**136**
17:45	18:00	0	0	0	0	9	0	55	64	**64**	25	13	0	38	0	5	3	8	**46**	**110**
Total:		24	52	3	79	161	27	1573	1761	**1840**	1495	409	34	1938	3	354	190	547	**1840**	**4,325**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		HAWTHORNE RD			RIDEAU RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total		0	0	**0**	0	0	**0**	**0**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	HAWTHORNE RD			RIDEAU RD			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	0	0	**0**	0	0	**0**	**0**
09:00 09:15	0	0	**0**	0	0	**0**	**0**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
11:30 11:45	0	0	**0**	0	0	**0**	**0**
11:45 12:00	0	0	**0**	0	0	**0**	**0**
12:00 12:15	0	0	**0**	0	0	**0**	**0**
12:15 12:30	0	0	**0**	0	0	**0**	**0**
12:30 12:45	0	0	**0**	0	0	**0**	**0**
12:45 13:00	0	0	**0**	0	0	**0**	**0**
13:00 13:15	0	0	**0**	0	0	**0**	**0**
13:15 13:30	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
Total	0	0	**0**	0	0	**0**	**0**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		HAWTHORNE RD									RIDEAU RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	1	0	**3**	0	0	7	**7**	**10**	8	0	0	**8**	0	1	5	**6**	**14**	**24**
07:15	07:30	0	0	0	**0**	0	1	8	**9**	**9**	9	0	1	**10**	0	2	1	**3**	**13**	**22**
07:30	07:45	1	0	0	**1**	0	0	12	**12**	**13**	10	0	1	**11**	0	1	1	**2**	**13**	**26**
07:45	08:00	0	2	0	**2**	0	0	9	**9**	**11**	12	0	0	**12**	0	0	1	**1**	**13**	**24**
08:00	08:15	0	0	0	**0**	0	1	12	**13**	**13**	4	0	0	**4**	0	0	1	**1**	**5**	**18**
08:15	08:30	0	1	0	**1**	1	1	6	**8**	**9**	13	1	0	**14**	0	0	0	**0**	**14**	**23**
08:30	08:45	0	2	0	**2**	0	1	11	**12**	**14**	14	0	1	**15**	0	0	1	**1**	**16**	**30**
08:45	09:00	0	0	0	**0**	0	0	13	**13**	**13**	7	2	0	**9**	0	1	0	**1**	**10**	**23**
09:00	09:15	0	1	0	**1**	0	0	17	**17**	**18**	8	1	0	**9**	0	0	1	**1**	**10**	**28**
09:15	09:30	0	0	0	**0**	3	0	8	**11**	**11**	9	0	1	**10**	0	1	0	**1**	**11**	**22**
09:30	09:45	0	1	0	**1**	1	0	9	**10**	**11**	9	1	1	**11**	0	1	0	**1**	**12**	**23**
09:45	10:00	0	1	0	**1**	0	2	11	**13**	**14**	9	0	0	**9**	0	1	0	**1**	**10**	**24**
11:30	11:45	0	1	0	**1**	0	1	8	**9**	**10**	12	1	0	**13**	0	1	0	**1**	**14**	**24**
11:45	12:00	0	2	0	**2**	0	1	7	**8**	**10**	10	1	0	**11**	0	0	0	**0**	**11**	**21**
12:00	12:15	0	1	0	**1**	2	0	12	**14**	**15**	16	1	0	**17**	0	0	0	**0**	**17**	**32**
12:15	12:30	0	0	0	**0**	0	0	8	**8**	**8**	9	0	0	**9**	0	2	0	**2**	**11**	**19**
12:30	12:45	1	0	0	**1**	0	0	8	**8**	**9**	6	0	0	**6**	0	0	0	**0**	**6**	**15**
12:45	13:00	1	0	0	**1**	0	1	7	**8**	**9**	10	0	2	**12**	0	1	0	**1**	**13**	**22**
13:00	13:15	0	1	0	**1**	0	2	8	**10**	**11**	4	1	1	**6**	0	1	0	**1**	**7**	**18**
13:15	13:30	0	1	0	**1**	1	1	8	**10**	**11**	7	1	0	**8**	0	1	0	**1**	**9**	**20**
15:00	15:15	2	2	0	**4**	0	2	5	**7**	**11**	10	0	9	**19**	0	1	0	**1**	**20**	**31**
15:15	15:30	0	5	0	**5**	3	1	10	**14**	**19**	7	0	3	**10**	0	0	0	**0**	**10**	**29**
15:30	15:45	3	5	0	**8**	0	3	13	**16**	**24**	14	0	1	**15**	0	2	0	**2**	**17**	**41**
15:45	16:00	1	3	0	**4**	0	1	9	**10**	**14**	10	2	4	**16**	0	2	1	**3**	**19**	**33**
16:00	16:15	0	6	1	**7**	1	0	11	**12**	**19**	8	0	0	**8**	1	1	0	**2**	**10**	**29**
16:15	16:30	1	3	0	**4**	0	0	9	**9**	**13**	9	0	0	**9**	0	3	0	**3**	**12**	**25**
16:30	16:45	0	2	0	**2**	1	1	7	**9**	**11**	9	1	2	**12**	0	1	0	**1**	**13**	**24**
16:45	17:00	0	1	0	**1**	0	0	8	**8**	**9**	7	0	0	**7**	0	1	2	**3**	**10**	**19**
17:00	17:15	0	0	0	**0**	0	0	12	**12**	**12**	3	0	0	**3**	0	1	1	**2**	**5**	**17**
17:15	17:30	0	0	0	**0**	0	0	8	**8**	**8**	2	1	0	**3**	0	0	0	**0**	**3**	**11**
17:30	17:45	0	0	0	**0**	0	0	4	**4**	**4**	2	1	0	**3**	0	0	0	**0**	**3**	**7**
17:45	18:00	0	0	0	**0**	0	0	6	**6**	**6**	6	1	0	**7**	0	0	0	**0**	**7**	**13**
Total:	None	12	42	1	**55**	13	20	291	**324**	**379**	273	16	27	**316**	1	26	15	**42**	**358**	**737**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

HAWTHORNE RD @ RIDEAU RD

Survey Date: Thursday, February 28, 2019 **WO No:** 38440

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		HAWTHORNE RD Northbound U-Turn Total	HAWTHORNE RD Southbound U-Turn Total	RIDEAU RD Eastbound U-Turn Total	RIDEAU RD Westbound U-Turn Total	Total
07:00	07:15	0	0	1	0	**1**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	1	0	0	**1**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	1	0	0	**1**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	2	1	0	**3**

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: HAWTHORNE RD @ RIDEAU RD

Traffic Control: Stop sign **Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-02, Mon,14:30	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jan-26, Thu,10:08	Clear	Rear end	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Passenger van	Other motor vehicle	
					South	Stopped	Truck - dump	Other motor vehicle	
2018-Nov-15, Thu,08:07	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jan-07, Mon,22:00	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Sep-11, Wed,21:00	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-15, Fri,13:53	Clear	Angle	P.D. only	Wet	South	Turning right	Truck and trailer	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	

APPENDIX E: PRELIMINARY TURNING MOVEMENT DIAGRAMS

1.6 MINIMUM LOT AREA	8,000m²	40,470m²
1.7 MINIMUM LOT WIDTH	50m	~m
1.8 MAXIMUM LOT COVERAGE	50%	~%
2.0 PARKING REQUIREMENTS		
2.1 OFFICE	335m² x (2.4/100m²) = 8.1 SPACES	8 SPACES
2.2 WAREHOUSE – FIRST 5000m2	5000m² x (0.8/100m²) = 40 SPACES	40 SPACES
2.3 WAREHOUSE	3090m² x (0.4/100m²) = 12.4 SPACES	13 SPACES
2.4 TOTAL PARKING	60.4 SPACES	61 SPACES
2.5 ACCESSIBLE PARKING SPACES	3 SPACES	3 SPACES
2.6 BICYCLE PARKING – OFFICE	335m² x (1/250m²) = 1.3 SPACES	2 SPACES
2.7 BICYCLE PARKING – WAREHOUSE	8090m² x (1/2000m²) =4 SPACES	4 SPACES
3.0 OTHER PARKING REQUIREMENTS		
3.1 LOADING FACILITIES	1 LOADING SPACE	1 LOADING SPACE

ASPH ASPHALT PAVING AREAS

CONC CONCRETE PAVING AREAS

RCC ROLLER COMPACTED CONCRETE AREAS

GRAV GRAVEL AREAS

GRASS GRASS AREAS

NEW FENCE LINE

PLANTED AREA, SEE LANDSCAPE DRAWING

BH-1 BOREHOLE LOCATION MARKER, REFER TO GEOTECHNICAL REPORTS. ALL BOREHOLES LOCATIONS ARE APPROXIMATE AND ARE FOR INFORMATION ONLY

VEHICULAR ACCESS DIRECTION

BARRIER FREE ACCESSIBLE PARKING MARKING

DC DEPRESSED CURB

BUILDING ENTRANCES & EXITS

FH FIRE HYDRANT

LP LIGHT POST

SI STANDPIPE SIAMEZE CONNETION

LEGEND SYMBOLS ARE TYPICAL AND MAY NOT ALL APPLY TO THIS SPECIFIC PROJECT.

ROAD ALLOWANCE BETWEEN LOTS 25 AND 26 — RIDEAU ROAD

LOT 26

LOT 25

BLOCK 13 0.30 RESERVE

BLOCK 11 STREET WIDENING

BLOCK 141 0.30 RESERVE

BLOCK 14 0.30 RESERVE

PART 33 PLAN 4R-26208

PART 35 PLAN 4R-26208

PART 29 PLAN 4R-26208 SUBJECT TO EASEMENT OC1253733

PART 31 PLAN 4R-26208 SUBJECT TO EASEMENT OC1252525

PART 30 PLAN 4R-26208

JOB BENCHMARK Magnetic Nail Elevations 97.47 (Grid Assumed Elevation 100.00)

SEE DETAIL B

SEE DETAIL A

TREE PRESERVATION

RAMP

CROSS-DOCKS (12,120SF – 1,126M2)

WAREHOUSE (73,615SF – 6,840M2)

OFFICE (2815SF – 262M2)

E-COMMERCE (4,935SF – 459M2)

PARKING (31 SPACES)

FIRE ROUTE

CONC

WELL

SHORT TERM PARKING

WET POND

TANK & PUMP

SEPTIC (SHALLOW BURRIED TRENCH)

SNOW STORAGE

GRASS

TRAILER STORAGE (14'x72' TRAILERS – 6 MAXIMUM)

GRAV

STORMWATER SWALE

FIRE POND

SIDEWALK

GLIDING GATE

SIGN

HEADWALL

MIN. FRONT YARD SETBACK (15m)

MIN. CORNER SIDE YARD SETBACK (15m)

MIN. INTERIOR SIDE YARD SETBACK (3m)

NEW FENCE ON PROPERTY LINE

Approximate Crown of Road

Edge of Asphalt

C/L Ditch

TOS

EOA

SAPPERS RIDGE

SOMME STREET

N 59°38'50" E

N 39°45'00" W

N 60°15'00" E 64.09

A=99.51 R=99.30 C=95.40 N 56°27'30" W

A=29.32 R=99.30 C=29.22 N 78°42'30" W

N 87°10'00" W

N 2°50'00" E 0.30

N 83°55'30" W

247.37

247.8

263.30

(Reference Bearing)

1 SITE PLAN
A100 1:500

KEY PLAN:

TRUE NORTH:

PROJEC

PRELIMI
NOT FOR CONST

RECORD OF REVISIONS:

NUMBER: REVISION:

ISSUE:

PROFESSIONAL STAMP:

PROFES

CIV
GR
ARCHITECTURE &

CIVITAS ARCHITECTURE INC. OTTAWA, ON
6 1 3 7 4 2
14 CHAMBERLAIN AVENUE, SUITE 101

CONSULTANT LOGO:

PROJECT TITLE:

FASTRA
OTTAWA WA
FACILI

SAPPERS R
OTTAWA, ON

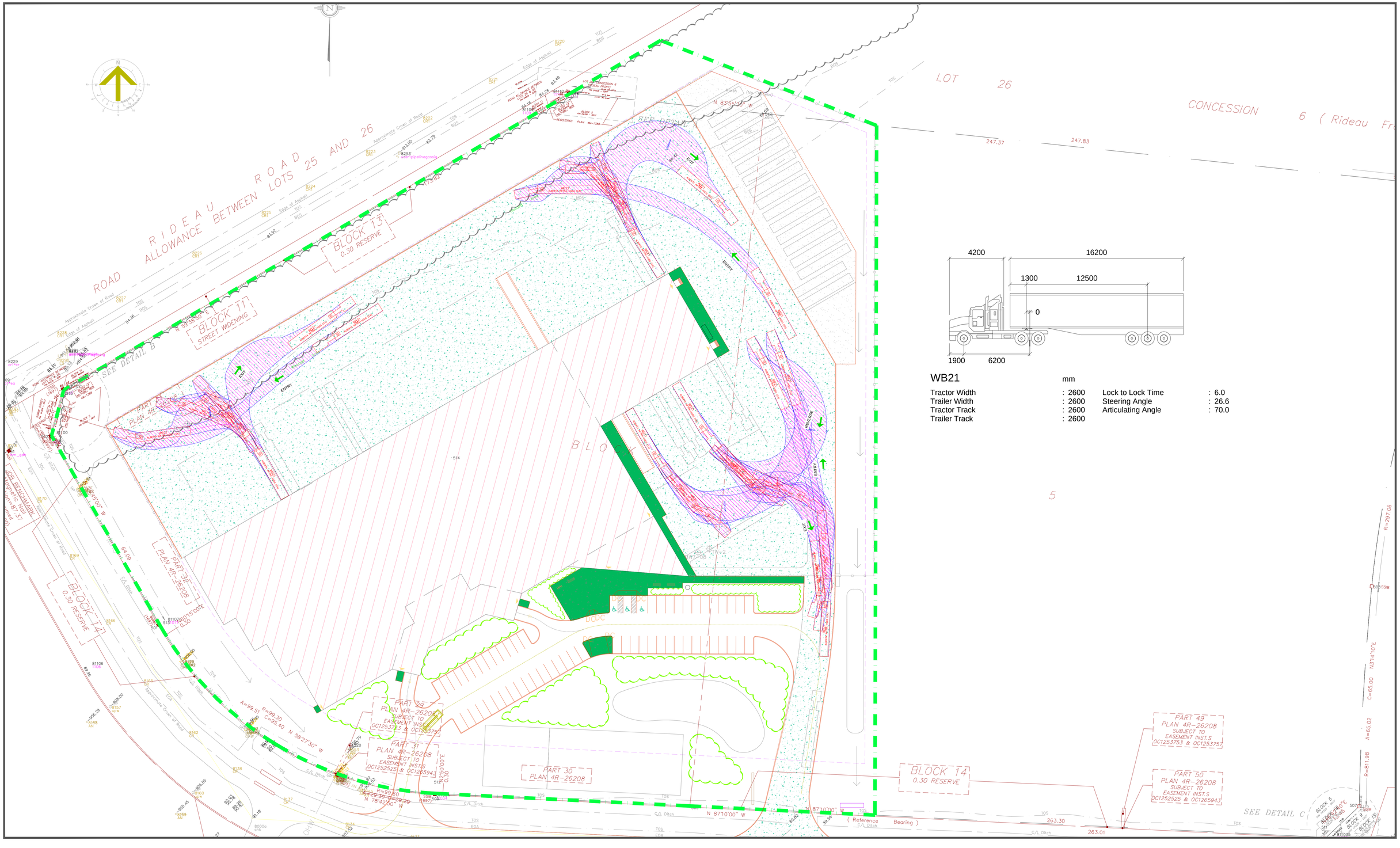
DRAWING TITLE:

SITE PLAN

DRAWN BY: DFR DRA
DATE: 21.03.05
REVIEWED BY: D.RANCIER
APPROVED BY: D.RANCIER
PRINT DATE: 4/1/2021 1:20 PM REV
ISSUED DATE: 21.03.05

CLIENT PROJECT #: PRO
####

C:\1. WORKING FROM HOME PROJECTS\ONTARIO\7263 – FASTFRATE DEVELOPMENT ? TIS\SITE PLAN\4 – MARCH 2021\2001 – FASTFRATE – A100-SITEPLAN_2021-03-05



WB21

mm

Tractor Width	: 2600	Lock to Lock Time	: 6.0
Trailer Width	: 2600	Steering Angle	: 26.6
Tractor Track	: 2600	Articulating Angle	: 70.0
Trailer Track	: 2600		

FASTFRATE OTTAWA – NEW FACILITY

CITY OF OTTAWA

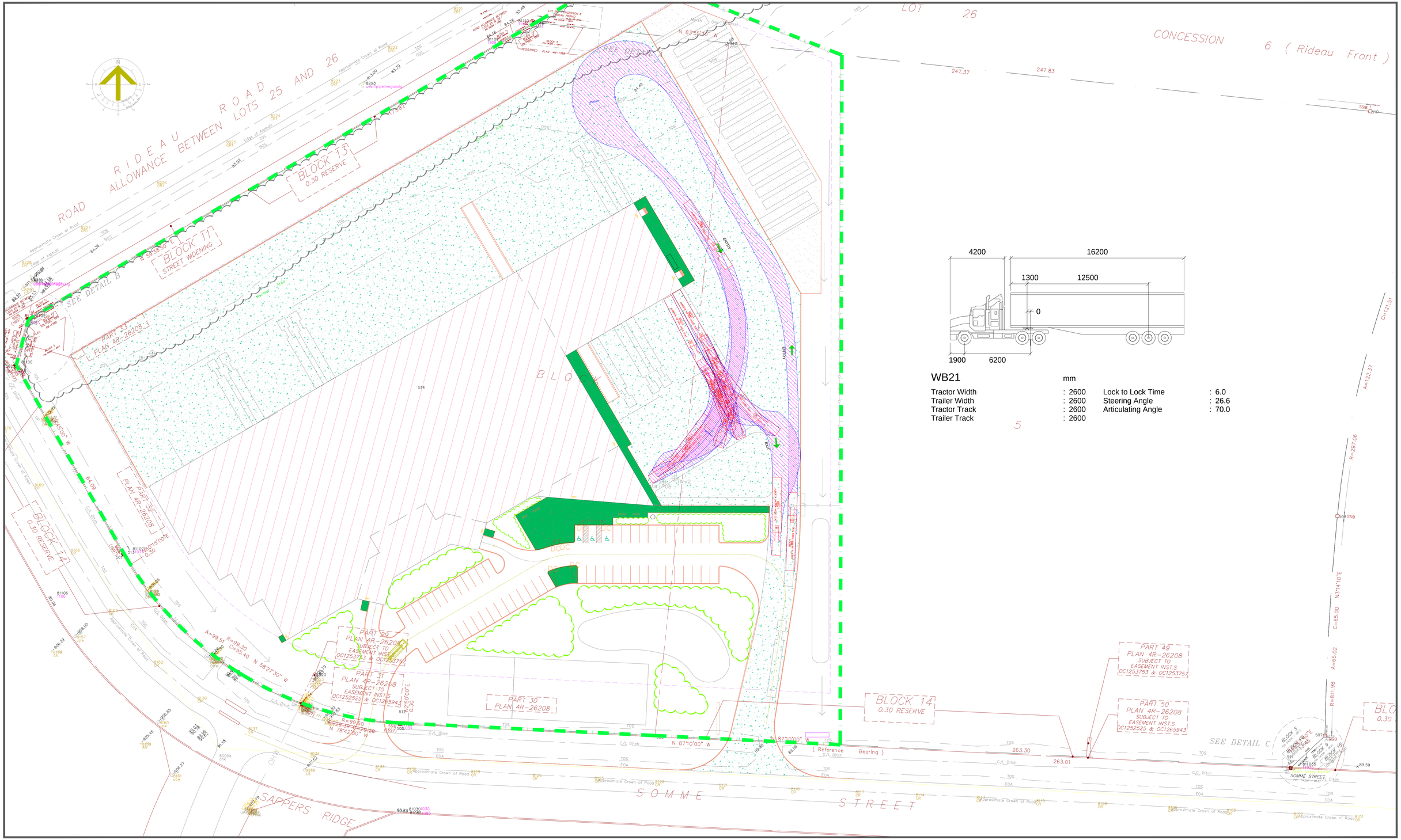
SCALE: 1:1100

DATE:

GRAPHIC SCALE: 0 11 27.5 55

SITE PLAN CONCEPT 1

A100



WB21

mm

Tractor Width	: 2600	Lock to Lock Time	: 6.0
Trailer Width	: 2600	Steering Angle	: 26.6
Tractor Track	: 2600	Articulating Angle	: 70.0
Trailer Track	: 2600		

5

FASTFRATE OTTAWA – NEW FACILITY

CITY OF OTTAWA

.

SCALE: 1:1100

DATE:

.

GRAPHIC SCALE: 0 11 27.5 55

SITE PLAN CONCEPT 1

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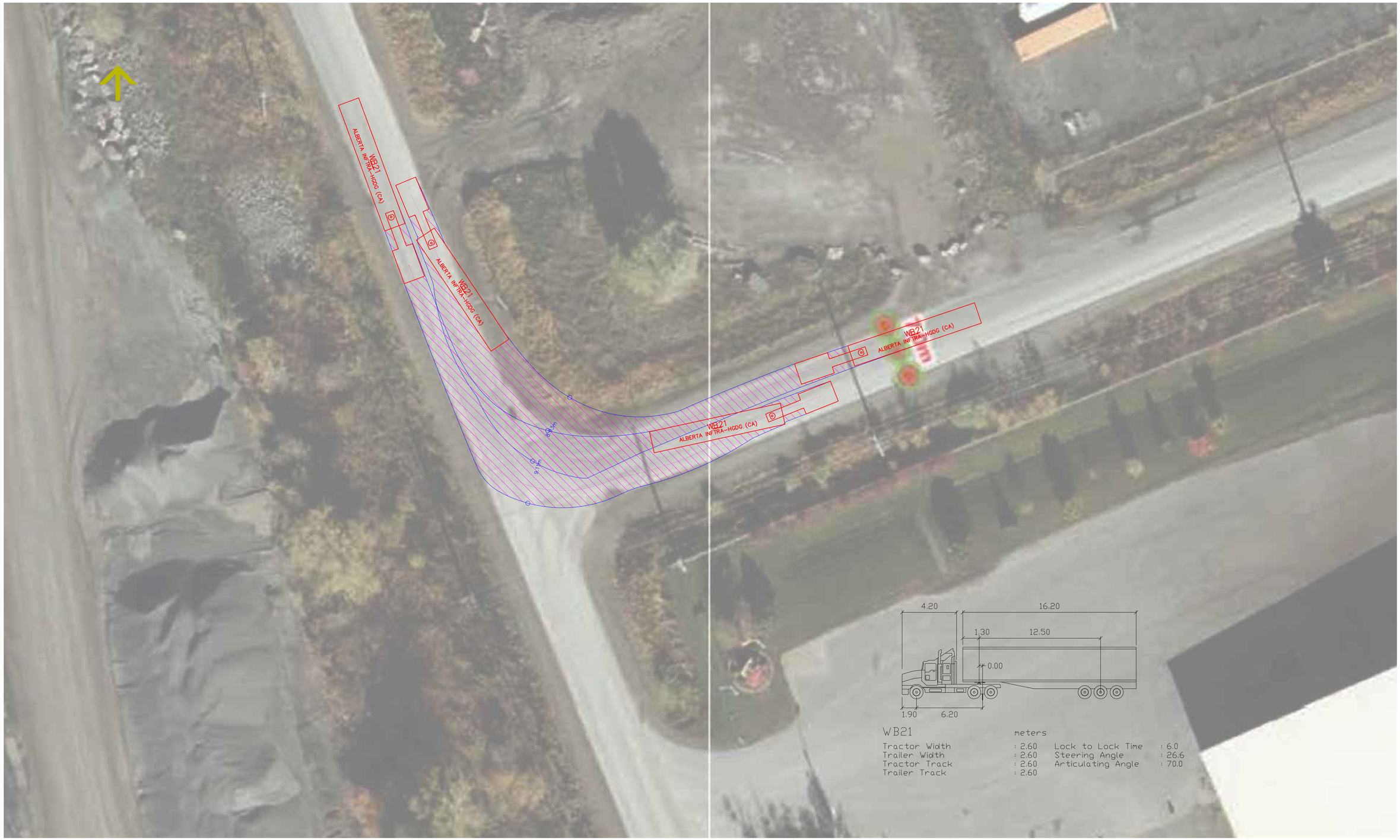
A100



FASTFRATE OTTAWA – NEW FACILITY

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Castleglenn Consultants
Engineers, Project Managers & Planners

APPENDIX F: INTERSECTION CAPACITY ANALYSIS
EXISTING AND 2022 BACKGROUND

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	125	4	0	83	18	6	16	2	7	3	364
Future Vol, veh/h	128	125	4	0	83	18	6	16	2	7	3	364
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	26	1	67	0	7	12	20	80	100	0	50	10
Mvmt Flow	135	132	4	0	87	19	6	17	2	7	3	383
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.6	9.4	9.1	11.5
HCM LOS	B	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	50%	0%	2%
Vol Thru, %	67%	49%	82%	1%
Vol Right, %	8%	2%	18%	97%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	257	101	374
LT Vol	6	128	0	7
Through Vol	16	125	83	3
RT Vol	2	4	18	364
Lane Flow Rate	25	271	106	394
Geometry Grp	1	1	1	1
Degree of Util (X)	0.041	0.421	0.158	0.478
Departure Headway (Hd)	5.862	5.607	5.36	4.373
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	612	647	672	815
Service Time	3.884	3.612	3.37	2.45
HCM Lane V/C Ratio	0.041	0.419	0.158	0.483
HCM Control Delay	9.1	12.6	9.4	11.5
HCM Lane LOS	A	B	A	B
HCM 95th-tile Q	0.1	2.1	0.6	2.6

Intersection	
Int Delay, s/veh	6.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	4	0	6	2
Future Vol, veh/h	0	20	4	0	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	21	4	0	6	2

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	18	4	0	0	4	0
Stage 1	4	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	992	1071	-	-	1598	-
Stage 1	1011	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	988	1071	-	-	1598	-
Mov Cap-2 Maneuver	988	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	997	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	5.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1071	1598	-
HCM Lane V/C Ratio	-	-	0.02	0.004	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	389	53	3	2	60	55	2	4	0	43	4	116
Future Vol, veh/h	389	53	3	2	60	55	2	4	0	43	4	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	9	0	80	0	5	8	0	33	0	0	67	36
Mvmt Flow	409	56	3	2	63	58	2	4	0	45	4	122
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.6	8.6	8.8	9.5
HCM LOS	C	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	87%	2%	26%
Vol Thru, %	67%	12%	51%	2%
Vol Right, %	0%	1%	47%	71%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	445	117	163
LT Vol	2	389	2	43
Through Vol	4	53	60	4
RT Vol	0	3	55	116
Lane Flow Rate	6	468	123	172
Geometry Grp	1	1	1	1
Degree of Util (X)	0.01	0.625	0.158	0.235
Departure Headway (Hd)	5.645	4.802	4.621	4.941
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	628	749	770	722
Service Time	3.733	2.853	2.686	3
HCM Lane V/C Ratio	0.01	0.625	0.16	0.238
HCM Control Delay	8.8	15.6	8.6	9.5
HCM Lane LOS	A	C	A	A
HCM 95th-tile Q	0	4.4	0.6	0.9

Intersection	
Int Delay, s/veh	5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	2	0	6	2
Future Vol, veh/h	0	4	2	0	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	50	100	5	50	100
Mvmt Flow	0	4	2	0	6	2

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	16	2	0	0	2	0
Stage 1	2	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.45	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	995	957	-	-	1356	-
Stage 1	1013	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	991	957	-	-	1356	-
Mov Cap-2 Maneuver	991	-	-	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	997	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	5.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	957	1356	-
HCM Lane V/C Ratio	-	-	0.004	0.005	-
HCM Control Delay (s)	-	-	8.8	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	132	132	11	0	87	22	9	24	2	7	20	375
Future Vol, veh/h	132	132	11	0	87	22	9	24	2	7	20	375
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	26	1	67	0	7	12	20	80	100	0	50	10
Mvmt Flow	139	139	12	0	92	23	9	25	2	7	21	395
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.6	9.8	9.5	12.9
HCM LOS	B	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	26%	48%	0%	2%
Vol Thru, %	69%	48%	80%	5%
Vol Right, %	6%	4%	20%	93%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	275	109	402
LT Vol	9	132	0	7
Through Vol	24	132	87	20
RT Vol	2	11	22	375
Lane Flow Rate	37	289	115	423
Geometry Grp	1	1	1	1
Degree of Util (X)	0.062	0.462	0.177	0.542
Departure Headway (Hd)	6.057	5.747	5.539	4.607
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	590	628	647	787
Service Time	4.104	3.781	3.58	2.607
HCM Lane V/C Ratio	0.063	0.46	0.178	0.537
HCM Control Delay	9.5	13.6	9.8	12.9
HCM Lane LOS	A	B	A	B
HCM 95th-tile Q	0.2	2.4	0.6	3.3

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	138	12	12	104	4	4
Future Vol, veh/h	138	12	12	104	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	145	13	13	109	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	158	0	287	152
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	135	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1403	-	697	886
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	884	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1403	-	690	886
Mov Cap-2 Maneuver	-	-	-	-	690	-
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	875	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	776	-	-	1403	-
HCM Lane V/C Ratio	0.011	-	-	0.009	-
HCM Control Delay (s)	9.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	4	0	30	2
Future Vol, veh/h	0	30	4	0	30	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	32	4	0	32	2

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	70	4	0	0	4	0
Stage 1	4	-	-	-	-	-
Stage 2	66	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	927	1071	-	-	1598	-
Stage 1	1011	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1071	-	-	1598	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	6.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1071	1598	-
HCM Lane V/C Ratio	-	-	0.029	0.02	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	401	47	8	2	65	68	8	19	0	53	17	119
Future Vol, veh/h	401	47	8	2	65	68	8	19	0	53	17	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	9	0	80	0	5	8	0	33	0	0	67	36
Mvmt Flow	422	49	8	2	68	72	8	20	0	56	18	125
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.4	9.1	9.2	10.3
HCM LOS	C	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	88%	1%	28%
Vol Thru, %	70%	10%	48%	9%
Vol Right, %	0%	2%	50%	63%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	27	456	135	189
LT Vol	8	401	2	53
Through Vol	19	47	65	17
RT Vol	0	8	68	119
Lane Flow Rate	28	480	142	199
Geometry Grp	1	1	1	1
Degree of Util (X)	0.047	0.662	0.193	0.283
Departure Headway (Hd)	5.917	4.966	4.89	5.127
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	608	720	739	692
Service Time	3.924	3.049	2.89	3.223
HCM Lane V/C Ratio	0.046	0.667	0.192	0.288
HCM Control Delay	9.2	17.4	9.1	10.3
HCM Lane LOS	A	C	A	B
HCM 95th-tile Q	0.1	5	0.7	1.2

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	89	12	5	121	15	5
Future Vol, veh/h	89	12	5	121	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	94	13	5	127	16	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	107	0	238	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1465	-	744	946
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	882	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1465	-	741	946
Mov Cap-2 Maneuver	-	-	-	-	741	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	878	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	783	-	-	1465	-
HCM Lane V/C Ratio	0.027	-	-	0.004	-
HCM Control Delay (s)	9.7	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	7.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	25	2	0	24	2
Future Vol, veh/h	0	25	2	0	24	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	60	100	5	60	100
Mvmt Flow	0	26	2	0	25	2

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	54	2	0	0	2	0
Stage 1	2	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	6.45	6.8	-	-	4.7	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.84	-	-	2.74	-
Pot Cap-1 Maneuver	947	935	-	-	1311	-
Stage 1	1013	-	-	-	-	-
Stage 2	963	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	929	935	-	-	1311	-
Mov Cap-2 Maneuver	929	-	-	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	7.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	935	1311	-
HCM Lane V/C Ratio	-	-	0.028	0.019	-
HCM Control Delay (s)	-	-	9	7.8	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

APPENDIX G: TDM-SUPPORTIVE DEVELOPMENT DESIGN AND INFRASTRUCTURE CHECKLIST (NON-RESIDENTIAL)

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.1—Development Design) requires proponents of qualifying developments to use the City's **TDM-Supportive Development Design and Infrastructure Checklist** to assess the opportunity to implement design elements that are supportive of sustainable modes. The goal of this assessment is to ensure that the development provides safe and efficient access for all users, while creating an environment that encourages walking, cycling and transit use.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM-Supportive Development Design and Infrastructure Checklist: Non-Residential Developments
- TDM-Supportive Development Design and Infrastructure Checklist: Residential Developments

Readers are encouraged to contact the City of Ottawa's TDM Officer for any guidance and assistance they require to complete this checklist.

Using the Checklist

This **TDM-Supportive Development Design and Infrastructure Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family or condominium only; subdivisions are exempt). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the design and infrastructure measures being proposed and provides additional detail on them.

Each measure in the checklist is numbered for easy reference. Each measure is also flagged as:

- REQUIRED —The Official Plan or Zoning By-law provides related guidance that must be followed.
- BASIC —The measure is generally feasible and effective, and in most cases would benefit the development and its users.
- BETTER —The measure could maximize support for users of sustainable modes, and optimize development performance.

Glossary

This glossary defines and describes the following measures that are identified in the **TDM-Supportive Development Design and Infrastructure Checklist**:

Walking & cycling: Routes
- Building location & access points
- Facilities for walking & cycling
- Amenities for walking & cycling

Walking & cycling: End-of-trip facilities
- Bicycle parking
- Secure bicycle parking
- Shower & change facilities
- Bicycle repair station

Transit
- Walking routes to transit
- Customer amenities

Ridesharing
- Pick-up & drop-off facilities
- Carpool parking

Carsharing & bikesharing
- Carshare parking spaces
- Bikeshare station location

Parking
- Number of parking spaces
- Separate long-term & short-term parking areas

Other
- On-site amenities to minimize off-site trips

In addition to specific references made in this glossary, readers should consult the City of Ottawa's design and planning guidelines for a variety of different land uses and contexts, available on the City's website at www.ottawa.ca. Readers may also find the following resources to be helpful:

- *Promoting Sustainable Transportation through Site Design*, Institute of Transportation Engineers, 2004 (www.cite7.org/wpdm-package/iterp-promoting-sustainable-transportation)
- *Bicycle End-of-Trip Facilities: A Guide for Canadian Municipalities and Employers*, Transport Canada, 2010 (www.fcm.ca/Documents/tools/GMF/Transport_Canada/BikeEndofTrip_EN.pdf)

▶ *Walking & cycling: Routes*

Building location & access points. Correctly positioning buildings and their entrances can help make walking convenient, comfortable and safe. Minimizing travel distances and maximizing visibility are key.

Facilities for walking & cycling. The Official Plan gives clear direction on the provision and design of walking and cycling facilities for both access and circulation. On larger, busier sites (e.g. multi-building campuses) the inclusion of sidewalks, pathways, marked crossings, stop signs and traffic calming features can create a safer and more supportive environment for active transportation.

Amenities for walking & cycling. Lighting, landscaping, benches and wayfinding can make walking and cycling safer and more secure, comfortable and accessible.

▶ *Walking & cycling: End-of-trip facilities*

Bicycle parking. The Official Plan and Zoning By-law both address the need for adequate bicycle parking at developments. Weather protection and theft prevention are major concerns for commuters who spend hundreds or thousands of dollars on a quality bicycle. Bicycle racks should have a design that enables secure locking while preventing damage to wheels. They should be located within sight of busy areas such as main building entrances or staffed parking kiosks.

Secure bicycle parking. Ottawa's Zoning By-law requires a secure area for bicycles at office or residential developments having more than 50 bicycle parking spaces. Lockable outdoor bike cages or indoor storage rooms that limit access to registered users are ideal.

Shower & change facilities. Longer-distance cyclists, joggers and even pedestrians can need a place to shower and change at work; the lack of such facilities is a major barrier to active commuting. Lockers and drying racks provide a place to store gear away from workspaces, and showers and grooming stations allow commuters to make themselves presentable for the office.

Bicycle repair station. Cycling commuters can experience maintenance issues that make the homeward trip difficult or impossible. A small supply of tools (e.g. air pump, Allen keys, wrenches) and supplies (e.g. inner tube patches, chain lubricant) in the workplace can help.

▶ *Transit*

Customer amenities. Larger developments that feature an on-site transit stop can make transit use more attractive by providing shelters, lighting and benches. Even better, they could integrate the passenger waiting area into a building entrance.

▶ *Ridesharing*

Pick-up & drop-off facilities. Having a safe place to load or unload passengers (for carpools as well as taxis and ride-hailing services) without obstructing pedestrians, cyclists or other vehicles can help make carpooling work.

Carpool parking. At destinations with large parking lots (or lots that regularly fill to capacity), signed priority carpool parking spaces can be an effective ridesharing incentive. Priority spaces are frequently abused by non-carpoolers, so a system to provide registered users with vehicle identification tags is recommended.

▶ *Carsharing & bikesharing*

Carshare parking spaces. For developments where carsharing could be an attractive option for employees, visitors or residents, ensuring an attractive location for future carshare parking spaces can avoid challenges associated with future retrofits.

Bikeshare station location. For developments where bikesharing could be an attractive option for employees, visitor or residents, ensuring an attractive location for a future bikeshare station can avoid challenges associated with future retrofits.

▶ *Parking*

Number of parking spaces. Parking capacity is an important variable in development design, as it can either support or subvert the mode share targets set during the transportation impact analysis (TIA). While the Zoning By-law establishes any minimum and/or maximum requirements for parking capacity, it also allows a reduction in any minimum to reflect the existence of on-site shower, change and locker rooms provided for cyclists.

Separate long-term & short-term parking areas. Because access to unused parking spaces can be a powerful incentive to drive, developments can better manage their parking supply and travel behaviours by separating long-term from short-term parking through the use of landscaping, gated controls or signs. Doing so makes it difficult for long-term parkers (e.g. commuters) to park in short-term areas (e.g. for visitors) as long as enforcement occurs; it also protects long-term parking capacity for its intended users.

▶ *Other*

On-site amenities to minimize off-site trips. Developments that offer facilities to limit employees' need for a car during their commute (e.g. to drop off children at daycare) or during their workday (e.g. to hit the gym) can free employees to make the commuting decision that otherwise works best for them.

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☒ Building entrance fronts parking lot
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☐
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐ N/A
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☐ N/A

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☐
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☐
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☒ Bicycle parking available fronting the office area
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☒ Bicycle parking meets By Law requirements
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☒ Bicycle parking located in an open space
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☒ Short-term parking provided fronting the site
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

APPENDIX H: HAWTHORNE ROAD/SOMME STREET FUNCTIONAL PLAN AND TURNING MOVEMENTS

CITY OF OTTAWA
HAWTHORNE ROAD AND SOMME STREET

PROPOSED INTERSECTION MODIFICATION
FUNCTIONAL PLAN

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7257

Contract No. 7263	Dwg. No. 01
Sheet 1 of 2	
Asset Group: ISD	
Des. RM	Chk'd. JB
Dwn. RM	Chk'd. AS
Utility Circ. No.	Index No.
Cost. Inspector	
Scale: 10m 0 10m HORIZ 1:500	

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	AS PER CITY COMMENTS	xx	XX/XX/XX

NOTES

CITY OF OTTAWA
HAWTHORNE ROAD AND SOMME STREET

PROPOSED INTERSECTION MODIFICATION
FUNCTIONAL PLAN

Castleglenn Consultants
Engineers, Project Managers & Planners

PROJECT REF. NUMBER: 7257

Contract No.	7263
Dwg. No.	01
Sheet 2 of 2	
Asset Group	ISD
Des.	RM
Chk'd.	JB
Dwn.	RM
Chk'd.	AS
Utility Circ. No.	
Index No.	
Cost. Inspector	
Scale:	10m 0 10m HORIZ 1:500

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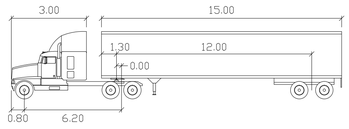
REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	AS PER CITY COMMENTS	xx	XX/XX/XX

NOTES



WB-19 meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 29.0
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		